AUG 25 1921
GENERAL LIBRARY

THE IRON TRADE REVIEW

Registered U. S. Patent Office

Published Weekly
VOL. LXIX. No. 8

CLEVELAND, AUGUST 25, 1921
Entered as second-class matter at the post-office in Cleveland, Ohio, under the act of March 3, 1879

Six Dollars a Year
Single Copy 25 Cents

We are manufacturers of about 20,000 articles, including valves, pipe fittings, and steam specialties, made of brass, iron, ferrosteel, cast steel and forged steel, in all sizes, for all pressures and all purposes, and are distributors of pipe, heating and plumbing materials.

THEY will close automatically; they may be drained when installed in horizontal or vertical positions; the vital parts may be easily examined at any time.

1855——— CRANE CO. ———1921

836 South Michigan Avenue, Chicago

Branches in 64 leading cities

Works—Chicago and Bridgeport

Faith

When the United States Steel Corporation adopted the recommendations of its Coke Committee and built the first Koppers By-Product Coke Plant in the United States, at Joliet, Ill., in 1908, it acted on *FAITH*—faith in the soundness of its Committee's judgment. The results secured from this plant justified this FAITH.

Since that first plant, more than 6500 Koppers By-Product Ovens have been built in this country—and in every case, the faith of the purchaser in our ability to design and build a plant capable of performing satisfactorily the work for which it was intended, has been more than justified—for into each new plant went the knowledge and experience gained in building the previous plants, plus that acquired from constant study and research work in this specialty.

The Koppers Company
Pittsburgh, Pa.

Vol. LXIX THE IRON TRADE REVIEW No. 8
Registered U. S. Patent Office
Cleveland, August 25, 1921

Volume of Inquiries Unchanged

Buying of Pig Iron Continues at Encouraging Rate—Railroads Award Repair Work on Cars—Export Business with Orient Is Brisk—German Cotton Ties Sold in United States

NEW inquiries coupled with a modest volume of buying are tending to sustain the feeling of optimism which has prevailed in the iron and steel markets since late in July. Interest in pig iron is even more pronounced than last week, while the trading in finished steel products continues almost unchanged. Mill operations in the Mahoning valley have been decreased slightly but this relapse is offset by improved conditions in other steel centers. In general, the market situation is practically as it was a week ago, except for an almost negligible increase in inquiries for pig iron.

Slight reductions in wages and freight rates are anticipated by reports issued during the week. On Aug. 29 the United States Steel Corp. will cut the wages of common labor to 30 cents per hour, which conforms to the scale paid by most of the independent companies. Several hundred employes of W. J. Rainey, Inc., have refused to accept a further reduction in wages. This is the first strike of coke oven workers in the Connellsville region since 1902. The Alabama Public Service commission has issued orders to the railroads to reduce the freight charges on raw materials for pig iron production 30 per cent by Oct. 1.

Prices Are Unchanged

Although the prices of certain grades of pig iron appear to be firmer, quotations have remained at a standstill during the week. The composite market average of THE IRON TRADE REVIEW, based on the selling prices of 14 iron and steel products, remains unchanged from last week at $36.03. This compares with $35.82 on Aug. 10, $38.14 for all July and $41.87 for June.

Sales of pig iron in Chicago and Philadelphia indicate that the recent buying movement was more extensive than disclosed. Sales of 10,000 tons of basic, 5000 tons of foundry and several lots of 2000 tons each of malleable were made in the western city last week. Inquiries for large tonnages aggregate more than 10,000 tons in New York and sales in eastern Pennsylvania totaled about 15,000 tons for the week. It is generally held that $18 basic iron has disappeared from the valley market, although a sale slightly above this figure involving a round tonnage is reported. A valley steel maker seeking basic failed to do better than $20, valley, and is considering blowing in a stack to make iron for his needs. The Buffalo interest which booked 20,000 tons of foundry iron at $18.50 to $19.50, has advanced its price to $20 to $22 and has sold 1000 tons at the new level.

Buys Coke at $2.75

More activity is noted in the coke market, due to inquiries from furnace operators. The American Rolling Mill Co. has closed on 30,000 tons of furnace fuel to be delivered at the rate of 10,000 tons monthly. The price is understood to be $2.75, ovens. Coke oven operators in Alabama are increasing operations.

The railroads are continuing to place orders for repairs of cars. Contracts have been awarded for work on 1500 cars by the Big Four, 200 by the Chicago Great Western and 400 by the Erie railroad. The Pere Marquette, Rock Island, and Buffalo, Rochester & Pittsburgh are asking bids for repairs to a total of about 2000 cars.

Buy German Steel

Hugo Stinnes has sold a small tonnage of cotton ties in the United States and German manufacturers have closed an order with Cuba for several hundred tons of rails rolled to American specifications. Interests in Mexico and the Orient have bought 20,000 boxes of tinplate at a price under $5.25, Pittsburgh. A Japanese agent recently placed orders for 1000 tons of plates, 400 tons of shapes and 1500 tons of rails. Chinese railroads are inquiring for material. It is reported by cable that an Indian firm representing Dorman, Long & Co. Middlesbrough, England, is the low bidder for the 100 mile water pipe for Bombay. The successful bid was equivalent to about $6,225,000.

THE IRON TRADE REVIEW

Registered U. S. Patent Office

Devoted to the Iron, Steel, Foundry and Metalworking Industries

Published Every Thursday by

THE PENTON PUBLISHING CO., CLEVELAND

Member, Audit Bureau of Circulation and Associated Business Papers, Inc.

BRANCH OFFICES

BOSTON - - - - - - - - - - - - - - 426 Old South Bldg.
CHICAGO - - - - - - - - - - - - - 1147 People's Gas Bldg.
CINCINNATI - - - - - - - 501-505 Commercial Tribune Bldg.
HARTFORD - - - - - - - - - - - - - P. O. Box 1231
NEW YORK - - - - - - - - - - 2205-2206 No. 220 Broadway
PITTSBURGH - - - - - - - - - - - 2148-49 Oliver Bldg.
WASHINGTON - - - - - - - - - - - 40 Metzerott Bldg.
SAN FRANCISCO - - - - - - - - - - 8 Monadnock Block

FOREIGN OFFICES

BIRMINGHAM, ENG. - - - - - - - - - Prince's Chambers
LONDON, ENG. - - - 2-3 Caxton House, Westminster, S. W. 1.

Cable Address, IROTRAPEN, London

Subscription, United States, Cuba and Mexico, $6 per year. Canada $8.50 and other Foreign Countries, $11 per year.

Entered at the Postoffice at Cleveland as Second Class Matter

Copyright 1921 by The Penton Publishing Co.

IN THIS ISSUE

	Page
Iron and Steel Market Review	459
Editorials	460, 461
Iron, Steel and Scrap Prices	462, 518, 522
Index to Market Reports	462
Iron and Steel Markets	463 to 473
Foreign Markets	475 to 478
Exporters Get Merchant Inquiries	479
Europe's Iron Reserves Defined	485
Avoiding Compressor Troubles	489
Lubrication Is Big Factor in Care of Air Compressors—Oil Must Have Suitable Properties—Explosions of External and Internal Origin Can Be Prevented by Cleaning Accumulations Periodically—Compressors Usually Over-Lubricated	
Mechanical Appliances Aid Efficiency of Historic Furnace	492
American Malleable Cast Iron—Chapter XVII—Pattern-making and Molding	496
News of Societies	499
Offers New Scrap Classification	500
Pig Iron Output First Half of 1921	502
Autumn Activity Is Foreshadowed	504
Steel Corporation Cuts Wages	509
Government Analyzes Retrenchment	509
Steel Exports Lowest in 7 Years	510
Machine Tools Moving Slowly	511
Construction and Enterprise	513
New Trade Publications	520
Industrial Business Changes Recently Announced	520

Are Prices Out of Line?

IN SPITE of all that has been said and written about price levels, the public seems to believe that the quotations on iron and steel are abnormally high. In fact in some quarters it is held that steel prices have not been reduced proportionately with those of other commodities. A number of authorities even charge that steelmakers are guilty of holding up prices and retarding the process of deflation. For some reason, such criticism seems to persist, even in the face of many authentic published reports which clearly show that price levels now are lower in proportion to manufacturing costs than they were in 1913 and 1914.

The true relationship of selling prices to costs is best illustrated by detailed figures such as have appeared in numerous articles published in recent issues of THE IRON TRADE REVIEW. However a brief consideration of the factors entering into the cost of making iron and steel is sufficient to justify existing levels.

Manufacturing costs are directly influenced by the amounts the producer has to pay for raw materials and labor. Ore and fuel are the principal raw materials, but to their actual cost must be added the transportation charges from mine to furnace. Therefore, the three most influential factors in the cost of making iron or steel are the charges for materials, freight and labor.

That coal is higher today than in 1914 is admitted everywhere. In fact, in many cases, the present freight charges alone exceed the delivered cost of the fuel in prewar days. Old range bessemer ore now costs $6.45 at lower lake ports as against $4.40 in 1914. Other grades have increased proportionately. Furnace coke in 1914 was quoted at $1.85 to $2, Connellsville; now it is listed at $2.75 to $3.25. Freight rates have increased more than 100 per cent during the seven-year period, and common labor, which was on a basis of 20 cents per hour in 1914, now costs 30 cents. Skilled labor is strenuously resisting radical price reductions, and wages in these lines have not been revised downward as consistently as those of common labor.

Considering these increases of 47 per cent on ore, 48 per cent on coke, a similar advance on other raw materials, and figuring in the accumulated effect of a more than 100 per cent increase in freight rates—and further allowing for a 50 per cent increased cost of common labor and a much higher advance for skilled worker's wages, the present prices do not seem far out of line.

	1914	1921
Basic pig iron, valley	$13.90 to 14.15	$18 to $20
No. 2 foundry, valley	13.90	20 to 20.50
Bars, Pittsburgh	1.30c to 1.35c	1.65c to 1.75c
Plates, Pittsburgh	1.20c to 1.25c	1.75c to 1.85c
Shapes, Pittsburgh	1.20c to 1.25c	1.70c to 1.85c
No. 28 galvanized sheets, Pittsburgh	2.95c to 3.00c	4.00c

Future prices depend upon fluctuations in the cost of fuel, labor and transportation, and indirectly upon taxes. With no hope of immediate reductions in any of these four items, it is difficult to see how prices will descend sharply from present levels. Competition will tend to lower prices, but permanent reductions will be governed by revisions in the cost of fuel, labor, transportation and taxes.

Convention Season Approaches

SEASONAL inactivity during the summer months has been pronounced among the technical societies and trade associations in the United States. Interest in business or profession lags when the call of vocations and avocations expands during the warm weather and therefore it is not surprising that the various organizations practically have suspended work until September.

Next month will mark the beginning of the Fall convention period. While not all of the organizations will hold their usual meetings, partly because of existing business conditions, the convention calendar is fairly representative and an unusually good

opportunity is given for the executives of the societies to plan meetings which will attract record breaking numbers of their members.

Getting in step with the industrial situation is one of the most important problems before the trade organizations. Business conditions seldom are surrounded with more contradictory influences than they are today and the average manufacturer or dealer welcomes assistance in interpreting each new development. The trade associations should be equipped to render this service to their members. They should gather information in financing, accounting and selling, and co-operate with members in properly interpreting significant events in the channels of industry.

This service on the part of the trade organizations should be supplemented by similar work by technical societies. Although engineers are not as closely interested in the trend of business conditions as are manufacturers and dealers, still the ultimate goal of the engineering profession is to assist business. At the present time when the mills and factories are slowly resuming operation after a period of comparative inactivity, there are many problems requiring the attention of engineers. Economy must be practiced in all industries if the nation is to meet foreign competition. Since economy was largely ignored during the war it now is necessary for American industries to develop the practice of efficiency and conservation more conscientiously than ever. Engineers can point the way. More standardization of materials is necessary and research must be carried forward intelligently. Engineers must be awakened to the new importance attached to the profession and must accept more fully the doctrines of Herbert Hoover and others, regarding the activity of engineers in public affairs.

If the executives of trade and technical organizations are determined to avail themselves of the opportunities offered, they will find more than enough work to keep every member active until vacation period again arrives next summer.

The Hand of Stinnes

EVER since Hugo Stinnes opened a branch office in New York considerable interest has been manifested by international traders as to the possible competitive relationship between the United States and Germany. Stinnes has sold cotton ties in this country and it is reputed he has been secretly negotiating for steamship connections, his name having been prominently mentioned in connection with the reorganization of the United States Mail Line. In the employ of Stinnes' New York office is an American steel man who is considered to be well versed in market conditions here.

Previous to this, some German steel was brought in but with dire results. For instance, a shipment of German nails which arrived in New York only a few months ago were found to be of an extremely poor quality. On the other hand it has been learned that a German mill has taken an order for rails for Cuba and not only given a very low price, and promised shipments will start within six weeks, but has agreed that the rails shall pass all tests of one of the recognized testing societies. To what extent the hand of Stinnes is behind all of these moves is not known, but with the clearing of the atmosphere it becomes more and more apparent that there is one man in Germany who knows how to deal largely and deal in a manner that is recognized as good business.

Stinnes has his day at court now because of the depressed condition of the exchange. Furthermore the German has many well-wishers in the United States who would do much to assist him in a good fight to pay his reparation bills. But the problem appears to be much more serious than one of purchase of German goods. It is coming to be a problem of permitting German capital to take possession of American enterprises. Hugo Stinnes is interested in the shipping because he realizes that successful trading is related to his ability to deliver his sales. The operations of this German business man in America will be watched closely.

Judge Landis and Labor

JUDGE LANDIS has laid down "the rules of the game" to labor. The judge is a distinguished jurist of high qualifications, and one of the most popular officials in public life because of his record on the bench and his outspoken opinions on matters affecting many people. His position in public life will give his utterances on labor more prominence and strength than anything he has said or done previously in labor's behalf.

Judge Landis held that "monopolistic elements of associations or unions are intolerable unless sufficient apprentices be taught to supply enough skillful managers and workers, and unless working rules and conditions eliminate waste of time, effort and material, increase quality and quantity of product; encourage improved methods, materials and appliances; produce increased skill and contentment of the workers and help to preserve peace in the community."

There were many more specifications such as these in Judge Landis' set of principles. Were they to have been defined by others they would have been read by certain classes of working people with suspicion and chagrin. The words being those of Judge Landis, they may be more generally understood and more thoroughly appreciated than if they had been handed down by a higher, but less popular, authority.

Iron and Steel Prices

Composite Market Average

Representing the Combined Average Prices per Ton of Fourteen Leading Iron and Steel Products. Yesterday, One Week, One Month, Three Months, One Year and Seven Years Ago

August 24, 1921	August 17, 1921	July, 1921	May, 1921	August, 1920	August, 1914
$36.03	$36.03	$38.14	$43.32	$68.87	$22.72

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe.

SCRAP PRICES, PAGE 522, WAREHOUSE, ORE, CAST IRON PIPE, FERROALLOYS AND OTHER PRICES, PAGE 518

Pig Iron

Bessemer, valley	$20.00
Bessemer, Pittsburgh	21.96
Basic, valley	20.00
Basic, Pittsburgh	21.96
Basic, Buffalo	19.00 to 20.00
Basic, delivered, eastern Pa.	20.00 to 20.50
Malleable, valley	20.00 to 20.50
Malleable, Pittsburgh	21.96 to 22.46
Malleable, Chicago	20.00
Malleable, Buffalo, furnace	20.00 to 21.00
Malleable, del., eastern Pa.	22.00 to 22.50

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X East'n and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 and up
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. IX, eastern del. Phila.	$22.35 to 23.00
No. IX, Buffalo	22.50 to 23.00
No. 2 foundry, valley	20.00 to 20.50
No. 2 foundry, Pittsburgh	21.96 to 22.46
No. 2 foundry, Buffalo	19.50 to 21.00
No. 2 foundry, Chicago	20.00
No. 2 foundry, Ironton furnace	20.50 to 22.00
No. 2 foundry, Cleveland	20.50 to 21.00
No. 2 foundry del. Philadelphia	20.35 to 21.25
No. 2 foundry, N. J., tidewater	21.30 to 22.25
No. 2X, eastern del. Phila.	20.85 to 21.75
No. 2X, eastern N. J., tidewater	21.80 to 22.75
No. 2X, eastern del. Boston	23.56 to 25.06
No. 2X foundry, Buffalo fur.	21.25 to 22.25
No. 2X, Buffalo del. Boston	24.96 to 25.96
No. 2 southern, Birmingham	19.00 to 20.50
No. 2 southern, Cincinnati	23.50 to 25.00
No. 2 southern, Chicago	24.66 to 25.66
No. 2 southern, Philadelphia	26.66 to 27.66
No. 2 southern, Cleveland	24.66 to 25.66
No. 2 southern, Boston	25.65 to 26.65
No. 2 southern, St. Louis	23.72 to 24.72
No. 2X, Virginia furnace	24.00 to 25.00
No. 2X, Virginia Philadelphia	29.74 to 30.74
No. 2X, Virginia Jersey City	30.29 to 31.29
No. 2X, Virginia Boston	30.58 to 31.83
Gray forge, eastern Pa.	21.25 to 22.75
Gray forge, val., del., Pitts.	20.46 to 21.46
Low phos., standard, valley	36.00 to 37.00
Low phos., standard, Phila.	43.32
Low phos., Lebanon furnace	35.00
Charcoal, Superior, Chicago	34.00 to 34.50
Charcoal, Birmingham	35.00

Silvery Iron

8 per cent base	
Jackson county, O., furnace	27.50
Tennessee, Chicago delivery	32.82
Ohio brands, Chicago	32.82

Bessemer Ferrosilicon

Jackson County, Ohio, furnace	
10 per cent	$36.50
11 per cent	39.80
12 per cent	43.10
13 per cent	47.10
14 per cent	52.10

Coke

Beehive, Ovens	
Connellsville furnace	$2.75 to 3.25
Connellsville foundry	3.75 to 4.25
Pocahontas furnace	8.00 to 8.50
Pocahontas foundry	8.50 to 9.50
New River furnace	6.50 to 7.50
New River foundry	8.00 to 8.50
Wise county furnace	5.25 to 5.75
Wise county foundry	6.00 to 7.00
Alabama furnace	4.50 to 5.00
Alabama foundry	5.50 to 6.00
By-Product	
Foundry, Newark, N. J., del.	$8.84
Foundry, Chicago, ovens	11.25

Semifinished Material

BILLETS AND BLOOMS (4 x 4-inch)	
Open-hearth, Pittsburgh	$30.00
Open-hearth, Youngstown	30.00
Open-hearth, Philadelphia	35.74
Bessemer, Pittsburgh	30.00
Bessemer, Youngstown	30.00
Forging, Philadelphia	40.74
Forging, Pittsburgh	35.00
SHEET BARS	
Open-hearth, Pittsburgh	$30.00 to 32.00
Open-hearth, Youngstown	30.00 to 32.00
Bessemer, Pittsburgh	30.00 to 32.00
Bessemer, Youngstown	30.00 to 32.00
SLABS	
Pittsburgh and Youngstown	$30.00 to 31.00
WIRE RODS AND SKELP	
Wire rods, Pittsburgh	$42.00
Grooved skelp, Pittsburgh	1.75c to 1.85c
Universal skelp, Pittsburgh	1.75c to 1.85c
Sheared skelp, Pittsburgh	1.75c to 1.85c

Shapes, Plates and Bars

Structural shapes, Pittsburgh	1.70c to 1.85c
Structural shapes, Philadelphia	2.05c to 2.20c
Structural shapes New York	2.08c to 2.23c
Structural shapes, Chicago	2.13c to 2.18c
Tank plates, Pittsburgh	1.75c to 1.85c
Tank plates, Philadelphia	2.10c to 2.25c
Tank plates, New York	2.13c to 2.28c
Tank plates, Chicago	2.13c to 2.18c
Bars, soft steel, Pittsburgh	1.65c to 1.75c
Bars, soft steel, Philadelphia	2.10c
Bars, soft steel, New York	2.13c
Bars, soft steel, Chicago	2.03c to 2.13c
Bars, hard steel, Chicago	1.85c to 1.90c
Bar iron, common, del. Pitts.	2.10c to 2.13c
Bar iron, common, Philadelphia	2.10c
Bar iron, common, New York	2.13c
Bar iron, common, Chicago	1.75c to 1.85c

MARKET REPORT INDEX

Weekly Market Review	459
Pig Iron	463
Coke	465
Bars	466
Nuts, Bolts, and Rivets	466
Plates	467
Scrap	468
Warehouse	468
Sheets	469
Tin Plate	469
Hoops and Bands	469
Concrete Reinforcing Bars	470
Structural Shapes	470
Wire	471
Cars, and Track Materials	471
Merchant and Cast Pipe	472
Semifinished Steel	472
Ferroalloys	472
Nonferrous Markets	473
British Market	475
French Market	476
Japanese Market	477
Belgian Market	477
Canadian Market	478
Export Market	479
Refractories	501
Coke By-Products	503
Machine Tools	511

Hoops, Bands, Shafting

Hoops, Pittsburgh	2.40c
Bands, Pittsburgh	2.20c to 2.40c
Cold finished steel bars, Pittsburgh base	2.50c to 2.60c

Rails, Track Material

Standard bessemer rails, mill	$45.00
Standard open-hearth rails, mill	47.00
Relaying rails, St. Louis	27.50 to 30.00
Relaying rails, Pittsburgh	30.00 to 35.00
Light rails, 25 to 45, mill	1.75c to 1.85c
Angle bars, Pittsburgh base	2.75c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.70c to 2.85c
Spikes, railroad, Chicago	3.13c to 3.23c
Track bolts, Pittsburgh	3.25c to 4.00c
Track bolts, Chicago	3.65c to 4.25c
Tie plates, Pittsburgh	2.25c to 2.50c
Tie plates, Chicago	2.00c to 2.25c

Wire Products

100 lbs. jobbers carloads; retailers	10c more
Wire nails, Pittsburgh	$2.75
Plain wire, Pittsburgh	2.50
Galvanized wire, Pittsburgh	3.00
Barbed wire, painted, Pitts.	2.90
Barbed wire, galv., Pittsburgh	3.40
Polished staples, Pittsburgh	2.90
Galvanized staples, Pittsburgh	3.40
Coated nails per count keg, Pitts.	2.35

Chain, Piling, Strip Steel

Chain, 1 in. proof coil, Pitts.	5.90c
Sheet piling base, Pittsburgh	1.80c to 1.90c
Hot rolled strip steel, Pittsburgh stamping quality	2.25c to 2.40c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, base	3.85c to 4.25c

Sheets

SHEET MILL BLACK	
No. 28, open-hearth, Pittsburgh	3.00c to 3.25c
No. 28, bessemer, Pittsburgh	3.00c to 3.25c
No. 28, open-hearth, Phila.	3.35c to 3.60c
No. 28, open-hearth, Chicago	3.20c to 3.63c
TIN MILL BLACK	
No. 28, open-hearth, Pittsburgh	3.00c to 3.50c
No. 28, open hearth, Chicago	3.38c to 3.88c
GALVANIZED	
No. 28, open-hearth, Pittsbgh	4.00c to 4.25c
No. 28, bessemer, Pittsburgh	4.00c to 4.25c
No. 28, open-hearth, Phila.	4.35c to 4.60c
No. 28, open-hearth, Chicago	4.38c to 4.63c
BLUE ANNEALED	
No. 10, open-hearth, Pittsburgh	2.40c to 2.65c
No. 10, bessemer, Pittsburgh	2.40c to 2.65c
No. 10, open-hearth, Phila.	2.70c to 3.00c
No. 10, open-hearth, Chicago	2.63c to 2.88c

Tin Plate

Per 100 lb. box

Tin plate, coke base, Pitts.	$5.25 to 5.50

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	64½	52
1 to 1½-inch, butt iron	39½	24½

Boiler Tubes

Steel, 3¼ to 13 inches, c. l.	52 off
Charcoal iron, 3½ to 4½ inches, c. l.	27 off

Prices Present and Past

Representative market figures yesterday, one month ago, three months ago and one year ago

	Aug. 24, 1921	July, 1921	May, 1921	Aug., 1920
PIG IRON				
Bessemer, valley, del., Pittsburgh	$21.96	$22.96	$26.06	$49.50
Basic, valley, del., Pittsburgh	21.96	20.86	23.96	49.40
No. 2 foundry, val. del., Pitts.	21.96	22.06	25.56	49.65
No. 2 Foundry, Chicago	18.50	19.35	22.85	46.00
Lake Superior charcoal, Chicago	34.00	36.85	38.50	57.50
Malleable, valley	20.00	20.40	24.10	48.25
Malleable, Chicago	18.50	19.35	23.35	46.50
*Southern No. 2, Birmingham	19.00	20.25	22.50	42.00
*Southern Ohio, No. 2 Ironton	20.00	20.50	24.50	46.50
Basic eastern del. eastern Pa.	20.50	22.25	25.00	47.40
**No. 2X, Virginia furnace	24.00	24.50	27.00	49.25
**No. 2X, eastern del. Phila.	21.25	23.50	26.10	51.00
Gray forge val. del. Pittsburgh	20.46	20.56	24.86	47.80
Ferromanganese, 80 per cent, del.	75.00	75.00	83.00	193.75
SEMIFINISHED MATERIAL—				
Sheet bars, bessemer, Pittsburgh	32.00	34.00	39.00	70.00
Sheet bars, open-hearth, Pitts.	32.00	34.00	39.00	71.25
Billets bessemer, Pittsburgh	30.00	32.25	37.00	61.25
Billets, open-hearth, Pittsburgh	30.00	32.25	37.00	61.25
FINISHED MATERIAL—				
Steel bars, Pittsburgh	1.75	1.85	2.10	3.25
Steel bars, Chicago	2.03	2.28	2.48	3.52

*1.75 to 2.25 silicon **2.25 to 2.75 silicon.

	Aug. 24, 1921	July, 1921	May, 1921	Aug., 1920
FINISHED MATERIAL Continued				
Iron bars, Philadelphia	$2.05	$2.15	$2.35	$4.75
Iron bars, Chicago mill	1.75	1.96	2.45	3.75
Beams, Pittsburgh mill	1.75	1.90	2.20	3.15
Beams, Philadelphia	2.15	2.15	2.55	3.50
Beams, Chicago	2.13	2.33	2.58	3.52
Tank plates, Pittsburgh	1.75	1.85	2.20	3.50
Tank plates, Chicago	2.13	2.33	2.58	3.77
Tank plates, Philadelphia	2.15	2.15	2.55	3.625
Sheets, blk., No. 28, Pittsburgh	3.00	3.35	4.00	7.00
Sheets, blue anl., No. 10, Pitts	2.40	2.55	3.10	5.00
Sheets, galv., No. 28, Pitts	4.00	4.35	5.00	7.50
Wire nails, Pittsburgh	2.75	2.85	3.10	4.00
COKE—				
Connellsville furnace ovens	3.00	2.75	3.25	17.75
Connellsville foundry, ovens	4.00	4.45	4.85	18.25
OLD MATERIAL—				
Heavy melting steel, Pittsburgh	13.00	12.00	13.65	27.75
Heavy melting steel, eastern Pa.	11.75	11.25	11.80	24.10
Heavy melting steel, Chicago	10.75	10.55	11.50	24.15
No. 1 wrought, eastern Pa.	14.50	14.75	15.25	33.25
No. 1 wrought, Chicago	10.25	10.25	11.85	28.50
Rerolling rails, Chicago	11.75	12.45	13.25	38.00

Activity in Pig Iron Is Sustained

Buying Follows Closely on Inquiry and Sizable Tonnages Continue To Be Placed—Price Situation Spotted, with Firmer Tendency at Pittsburgh—Movement at Chicago Previous To Advance Proves Larger Than First Indicated

Philadelphia, Aug. 23.—While the recent price range still prevails on foundry iron the tendency is upward. No. 2 plain is going at $19.50 to $20, furnace, and No. 2X as high as $20.50. Concessions can be obtained where tonnage is especially desirable or where competitive freight rates enter in, but it is increasingly difficult. Some sellers are firm at $20 for No. 2 and $20.50 for No. 2X. No. 1X is scarce and firm at $21 to $21.50 furnace. Recent sales of foundry iron to consumers in this district approximate 5000 tons, principally for nearby shipment. Including sales to other eastern sections, furnaces in this district booked close to 15,000 tons. Pipe makers are reported to be the principal buyers in nearby territory. Small lots of malleable are moving, with the price around $21, furnace. Two sales were made at substantially higher figures but not indicative of the situation. No sales of basic or low phosphorus iron are reported here. Prices are nominal.

Inquiries Are Encouraging

Cleveland, Aug. 23.—Although buying is slightly lighter than last week, inquiries in the pig iron market are appearing in greater volume and the general tone of the market is encouraging. A Detroit manufacturer is inquiring for 1000 tons of malleable. A Pittsburgh interest is asking prices on 500 tons of bessemer iron and an upper Ohio valley producer is inquiring for 1000 tons of basic. A number of sales of No. 2 foundry iron have been made including one lot of 1000 tons at $20.50 valley. Most of the iron sold during the past week went at this figure, although it is understood that some tonnage was taken at $20 valley. A number of lots of low phosphorus iron ranging from 50 to 100 tons each were sold at $36, valley furnace. Shipments from furnaces in this district are continuing at the rate of 100 per cent in excess of those of last month.

Pittsburgh Price Higher

Pittsburgh, Aug. 23.—A noticeable improvement is current in pig iron this week, insofar as prices are concerned. The general feeling is that $18 for basic has disappeared on prime stock, although it is not uncommon to hear of off-grade tonnages being offered for less than $20. The usual price is $19.50, valley. A few steel melters have been shopping around in hope of developing a price on basic under $18, but so far as can be ascertained, their efforts were discouraging. A steelworks had an inquiry out for 1000 tons of basic and hoped to develop at least a price around $19. The best it could do, however, was $20, valley. The strength of the price of basic iron is not due to demand but is attributed to the fact that producers are now beginning to realize that to press their sales at a loss spells disaster. In well-informed circles it is learned that a valley steelmaker tried to buy basic under $20 recently, and failing to do this he has about decided to blow in his own stack. While there are only three or four steelmakers who are in a position to sell basic there is no evidence that this product can be obtained from them for less than $20 furnace. In fact, one company with steelworks fronting on the Ohio river is now quoting basic at $21 furnace. In connection with the valley interest who plans to blow in his furnace within a month it is understood the supply of coke will come from a nearby steelmaker having by-product ovens. Under a special arrangement interests closely associated with the furnace in question now are negotiating with the by-product maker for supplying the coal from which to produce the coke. In the bessemer market tonnages still are available at $20, valley. Inquiries for this grade still are confined to small lots. One consumer of bessemer, however, is understood to be inquiring with a view to obtaining prices on 1000 tons of this grade. While his requirement is not pressing, it is understood that if a low enough figure can be developed he will place the order. It is generally believed that bessemer will advance in sympathy with basic, at least $1 a ton. Inthe interim, however, stocks are being held at $20 to encourage the placing of business. No. 2 foundry iron is quotable at $20.50, valley, but not much of this grade is on stock pile. It is estimated that not more than 35,000 tons of foundry iron now is in stock in both the Mahoning valley and Pittsburgh district, and of this amount probably less than two-thirds is in the furnace yards of one producer. Some makers of this grade with idle furnaces are distributing their stocks sparingly to customers and are quoting 50 cents a ton higher than the prevailing price to consumers who buy from them. An inquiry for 1500 tons of No. 2 foundry is current this week although it is questionable whether it will terminate in actual business.

Buying Continues at Chicago

Chicago, Aug. 23.—Details of the buying movement when Chicago furnaces advanced their price to $20 indicate that more tonnage was moved than

disclosed. Aside from 10,000 tons of basic the largest sale was 5000 tons of foundry and two or more lots of 2000 tons of malleable. Inquiry continues steady and buying follows closely at the higher rate. Current inquiry includes 400 tons of foundry iron. Others are for 100 to 500 tons, and many carlots. The price is firm at $20. All merchants stacks remain out. Silveries are quiet and the Jackson county schedule prevails at $27.50. Eight southern makers of silveries are down. A sale of 1000 tons of low phosphorus iron was made to a Milwaukee user at $40, delivered, several days ago.

Southern Market Stronger

Birmingham, Ala., Aug. 22.—The pig iron market in the South has assumed a much stronger position, several incidents indicating that the turn for the better has actually set in and that within another 60 days there will have been several blast furnaces started up and the order books will have been opened and indentures made. The quotations for pig iron have taken on some strength also and $19 per ton is the minimum for No. 2 foundry, 1.75 to 2.25 per cent silicon, with some of the furnace companies still maintaining $20 and $20.50. Some little selling is still being reported, local consumers in the main being the purchasers. Inquiries have been received from some little distance, the understanding being that northern furnace interests have withdrawn their minimum prices. Further reduction of the stocks on hand in this section is noted and as a consequence it is believed there will be need for blowing in of furnaces during September, semi-authoritative report being that three furnaces now idle will be making iron by the latter part of the coming month. The Alabama Public Service commission has issued an order to the railroads to reduce freight on raw material to the pig iron manufacturing plants approximately 30 per cent by Oct. 1 and this will bring about a readjustment that will be favorably received. Cast iron and sanitary pipemakers have a number of orders yet to fill and there promises to be a steady melt of iron in this district for some time to come. Reports are again current of a large tonnage having been sold or under negotiation.

Sales Aggregate 3000 Tons

Cincinnati, Aug. 23.—The movement of small tonnage lots of pig iron through the Cincinnati market continues to increase but there has not been the improvement which had been anticipated. Aggregate sales reported here last week were approximately 3000 tons, practically all of which was for nearby delivery. The number of inquiries has increased slightly, but no sizable tonnage has been offered local representatives of furnaces. The southern market, which has shown pronounced strength, is attracting a little more attention, some of the new inquiries specifying a preference for Alabama iron. A two car lot of northern No. 2 foundry, 1.75 to 2.25 silicon, is wanted by a consumer at Bedford, Ind., and there are a number of lesser tonnage lots offered for nearby shipment. Stock inventories of southern Ohio furnaces show dwindling reserves and the market is strong at $20.50 to $21, Ironton, with a majority of recent sales reported within that range.

Nearly 10,000 Tons Wanted

New York, Aug. 23.—Between 5000 and 6000 tons of pig iron is represented in new inquiry in this district. This is virtually all foundry iron, and includes a lot of 2000 tons of No. 2 Plain and No. 2X for a stove maker in this district for delivery over the remainder of the year, and a lot of 1000 tons of the same grades for a local consumer. In addition to the aggregate of 5000 to 6000 tons, is a lot of 3000 to 4000 tons of foundry iron being tentatively figured upon by a pipe maker of Florence, N. J. An inquiry for 1500 tons of foundry iron for an eastern Pennsylvania consumer is also noted.

Outstanding among orders is a lot of 1500 tons of foundry for delivery in September. Other orders aggregated possibly 3000 tons for various shipments over the remainder of the year. One seller sold two lots of 500 tons each, principally for fourth quarter. A sale of 1000 tons of malleable for a central Pennsylvania consumer is reported.

Business of the week further established the market at levels of around $19.50, furnace, on No. 2 plain, 1.75 to 2.25 silicon, and $20 on No. 2X, 2.25 to 2.75 silicon, shading in either instance being more difficult than heretofore and likely only when the tonnage is especially desirable or where there is a disadvantage in freight rates. In some instances, sellers are holding firmly at the $20, base, on both grades, and in one or two cases, at half a dollar higher on No. 2X. Little malleable was sold directly in this district, with the market appearing nominally at $19 to $20, eastern Pennsylvania furnace. No sales of low phosphorus were reported.

Inquiries Aggregate 2000 Tons

St. Louis, Aug. 22.—Sentiment in pig iron through this district continues fairly optimistic, with prices firm. Melters generally seem to be taking more interest in the market, and while the melt has not augmented in any noticeable degree, there is a disposition to prepare for expected business. Actual sales in the week total from 600 to 700 tons, but inquiries are before the market calling for close to 2000 tons. The demand centers chiefly in foundry grades, basic iron continuing as inert as heretofore. The selling agencies say the present movement would be much more pronounced, but for the fact that most of the important buyers are away on vacations.

One feature which the recent inquiry has developed is the great scarcity of certain specific grades. It is found more and more difficult to fill orders for specified analysis, and until requirements loom more formidably than at present there is little likelihood of idle stacks blowing in to fill assortments. The almost universal comment is on the depleted stocks on furnace yards. At the close of the week the price had settled fairly firmly at $20 base for No. 2 foundry, containing 1.75 to 2.25 per cent silicon.

Composite Market Record

Monthly Averages of 14 Products, 1913-1921, Compiled by The Iron Trade Review

1921		1918		1915	
Aug. 17	$36.03	Dec.	$57.17	Dec.	$31.56
Aug. 10	35.82	Nov.	55.63	Nov.	28.64
Aug. 3	36.56	Oct.	57.49	Oct.	26.19
July 27	36.69	Sept.	56.56	Sept.	25.55
July 20	37.55	Aug.	56.67	Aug.	24.77
July 13	38.61	July	56.66	July	24.25
July 6	39.69	June	56.62	June	23.74
Ave. for July	38.14	May	56.59	May	22.89
June	41.87	April	56.59	April	22.66
May	43.32	Mar.	56.71	Mar.	22.71
April	43.84	Feb.	56.67	Feb.	22.21
Mar.	45.37	Jan.	56.67	Jan.	21.90
Feb.	48.81	Ave. for year	56.67	Ave. for year	24.76
Jan.	51.98				
1920		**1917**		**1914**	
Dec.	53.45	Dec.	56.68	Dec.	21.58
Nov.	63.75	Nov.	58.29	Nov.	23.39
Oct.	68.61	Oct.	67.75	Oct.	22.84
Sept.	68.86	Sept.	83.18	Sept.	23.17
Aug.	68.87	Aug.	89.69	Aug.	22.72
July	68.69	July	89.56	July	22.17
June	68.29	June	82.66	June	22.58
May	68.66	May	73.96	May	22.99
April	67.49	April	66.48	April	23.39
Mar.	65.47	Mar.	61.07	Mar.	23.60
Feb.	65.63	Feb.	56.76	Feb.	23.52
Jan.	59.40	Jan.	55.10	Jan.	23.03
Ave. for year	65.60	Ave. for year	70.10	Ave. for year	22.92
1919		**1916**		**1913**	
Dec.	55.20	Dec.	53.68	Dec.	23.29
Nov.	52.37	Nov.	46.77	Nov.	24.02
Oct.	49.16	Oct.	41.50	Oct.	24.91
Sept.	48.75	Sept.	39.97	Sept.	25.55
Aug.	48.67	Aug.	39.67	Aug.	25.97
July	48.26	July	39.37	July	26.34
June	48.28	June	39.63	June	26.78
May	48.69	May	39.78	May	27.34
Apr.	48.85	April	39.13	April	27.74
Mar.	52.68	Mar.	37.18	Mar.	27.93
Feb.	53.71	Feb.	35.63	Feb.	28.05
Jan.	53.81	Jan.	33.66	Jan.	27.96
Ave. for year	50.70	Ave. for year	40.50	Ave. for year	26.32

The stove plants in the main still are idle but all report business in July and early August the most satisfactory in several months. Improvement is noted particularly in the winter wheat belt, where farmers are rapidly marketing the crop and applying the proceeds to paying their debts and purchasing commodities.

Buyers Await Price Stability

Boston, Aug. 23.—The increased buying of a week ago was apparently a short flurry, due to expected advances in prices, as the past week has seen a return to the normal quiet conditions. Prices at Buffalo and eastern Pennsylvania, the only two districts serving New England at present, have materially stiffened, and melters now are waiting to see whether the new price levels are going to hold before placing any further tonnage. The soft spots in the eastern Pennsylvania field have disappeared at least as far as the small buyer is concerned. One furnace interest has made two advances of 50 cents each during the past week. Another furnace selling at $18.50 for the base grade a week ago is now on a $19 level or $23.06 delivered to New England. A textile machine interest which has been in the market for some time placed 3000 tons a week ago just before prices advanced. The price is reported as being under $19, furnace, or $23.06 delivered for 2 to 2.50 silicon iron. The Lackawanna furnace which recently placed considerable iron throughout New England at low prices has advanced to a $20 base which means $25.46 delivered New England. Buffalo iron at the present time is unable to compete in price in New England with the eastern Pennsylvania furnaces and in the latter district it is only the operating furnaces which are able to sell in the present market. The entire trade is eagerly watching the development of the upward tendency in prices. Some observers feel it is temporary and look for a further decline based upon the low production among New England foundries. Others feel that with only seven furnaces in operation among those usually supplying New England, the market is bound to hold firm. Reports from the South indicate a healthy improvement in orders, resulting in the blowing in of one of the Woodward furnaces. The furnace price in the southern district is still too high for shipment to New England.

Recent sales in Boston have been limited almost exclusively to car lots. Buffalo iron has sold at $21, furnace, or $26.46, delivered, for 2.25 to 2.75 silicon iron. Eastern Pennsylvania iron has sold as high as $20 or $24.06, delivered for the base grade. Inquiry has fallen off. A Boston stove manufacturer is understood to be in the market for 1500 tons.

Buffalo Interest Raises Price

Buffalo, Aug. 23.—While sales during the past week have been somewhat lighter than the preceding week when 25,000 tons were sold, last week produced a fair amount of business. The interest which booked 20,000 tons at $18.50 to $19.50 has raised its price to $20 to $22. Prior to this it booked a total of about 30,000 tons. It has sold about 1000 tons at $20 to $22. Another producer reports a fairly active week, sales totaling 5000 tons on a base price of about $20. Many of the orders were small but the volume was considerably larger than usual, and the producer believes the market is improving. Total inquiry reported by this interest involved 9000 tons. This included an inquiry for 3500 tons for the American Radiator Co., reported to have been closed later with a local furnace at a low price. While the market apparently has stiffened there are reports of low-priced iron having been placed here. One producer bidding for business learned of a quotation of $18.25 on low-silicon iron, while another was told tonnage could be placed here at $20 for the high-silicon grade. One furnace interest here is maintaining a price of $21 for No. 2 foundry iron but is doing little business. Small malleable lots have been sold at $21.

Coke Demand More Active

Ohio Rolling Mill Reported To Have Placed Tonnage at $2.75—Little Now Available at This Figure—Furnaces Eager To Contract

COKE PRICES, PAGE 462

Pittsburgh, Aug. 23.—Signs of greater activity are beginning to appear in the coke market. More talk is heard of furnaces blowing in. Furnace owners are beginning to ask for prices on forward delivery, and in a number of cases are showing interest in prices and shipments for the last quarter. The American Rolling Mill Co., Middletown, O., closed late last week on its coke requirements necessary for blowing in and operating one of its stacks. Its requirements, as regularly put out, embrace enough fuel for a three-months run, which in all probability will average in the neighborhood of 10,000 tons monthly or a total of 30,000 tons. While the price is not commonly known, it is understood to have paid $2.75, ovens.

The closing figure on this tonnage under present conditions is said to be attractive, little contract coke of fine quality now can be had for $2.75. Prices generally quoted now range from $2.85 to $3, ovens, and there appears to be a scarcity of Connellsville fuel at lower than the minimum price mentioned. One dealer in this district has an attractive tonnage of Connellsville furnace coke which he is endeavoring to place at $2.75, ovens, but so far has been unsuccessful. The maximum price of $3, ovens, more nearly represents the market at present for Connellsville furnace grade, and on account of strikes interferring somewhat with production, it is thought the price may stiffen somewhat. Demand for foundry coke still is light. The market remains quotable from $4 to $4.50, with the majority of sales at the maximum figure. Estimates of production in the Connellsville district usually published by the *Connellsville Courier*, still are lacking due to the illness of the editor.

Selling Small Lots

Philadelphia, Aug. 23.—Coke buying is confined chiefly to small lots. Foundry coke is being sold around $4.25, Connellsville. The market for furnace coke is dull and nominally unchanged.

Market Has Better Tone

Birmingham, Ala., Aug. 22.—While there is no new business of consequence in the coke market, a better feeling is noted. Production has been increased by furnace companies which do not sell their coke in the open market. Some business with Mexico is reported. Quotations continue around $5.50 to $6 for foundry and $4 for furnace-coke. Several foundries in this district are beginning to get in some orders and this may increase the demand for coke. Local consumption of coke is growing. The Tennessee Coal, Iron & Railroad Co. and the Woodward Iron Co. started additional batteries of their by-product plants this month. The Semet-Solvay Co. is expected to start some of its by-product ovens at Ensley next month. The beehive coke ovens of the Yolande Coal & Coke Co. and the Alabama Co. are in operation and the prospects are that all of the ovens of these two companies will soon be in operation.

Demand Well Maintained

New York, Aug. 23.—Firmness characterizes the coke market, foundry still holding at $4.25 to $4.50, Connellsville, and furnace at $3 to $3.25. Demand is being well maintained, especially for the foundry grade. By-product foundry coke is being quoted by the Seaboard By-products Coke Co. at $4.50, Connellsville.

Firmer Tendency Noted

Cincinnati, Aug. 23.—The Louisville & Nashville railroad is in the market for 400 tons of coke. Other inquiries are for single carloads and smaller lots. The market has a firmer tendency, quotations for Connellsville furnace and foundry grades being marked up fractionally. A recent sale of a small tonnage of foundry coke from the Connellsville field is reported at $4, ovens.

More Tonnage Placed

St. Loujs, Aug. 22.—Considerable interest is shown here in an inquiry for 2000 tons of coke for delivery to Mexico in August and September. More inquiries are being received. More orders are being placed, and there generally is a better feeling in the trade. Standard Connellsville foundry coke is being quoted at $4 to $4.50, ovens, with special brands up to $5.25. Furnace coke is $1 less.

Market Still Listless

Boston, Aug. 22.—The coke market remains dull. Consumers are buying from hand to mouth and quiet conditions are reported at most of the foundries. The price of by-product coke is unchanged at $10.66, delivered.

Bar Tonnage Increasing

Chicago Producer's Bookings Doubling Those of July—Makers Shading 1.75c and Conceding Freight Charges—Material Wanted Quickly

BAR PRICES, PAGE 462

Chicago, Aug. 23.—As an indication of the gradual betterment of demand for soft steel bars, the statement is made on authority that an important producer in the Chicago district finds its finished steel bookings thus far in August double those taken the corresponding portion of July. While this does not represent a large tonnage the movement is in the right direction. The tonnage does not yet equal production old contracts making up the balance. Automoible builders continue their activity and have not experienced the recession they expected. Agricultural implement makers are still out of the market. Railroads are getting car repairs underway, with consequent demand for bars and other material. The price of 1.75c, Pittsburgh, is being shaded and part of the freight differential is being conceded. However, less shading is evident than a short time ago. Demand for bar iron is light, railroads being the only buyers. The market appears to be 1.75c, Chicago mill. Hard bars show no life and the price is nominal.

Want Material Quickly

Pittsburgh, Aug. 23.—Evidence of any flurry in the merchant steel bar market still is lacking. Inquiries are scant and the little buying current is for negligible quantities. Shipments are desired as soon as possible. While fancy prices are reported to have been quoted on large lots, confirmation is lacking as to their application on firm business. The usual quotation of 1.75c, base Pittsburgh, generally is mentioned in connection with the few sales closed recently. Iron made from all-muck bar is being held at 4.50c, Pittsburgh, by a few makers and ordinary refined iron is quoted at 3.50c. The majority of mills are holding this product at 2.25c, Pittsburgh, for business aggregating carload lots and at 2.40c for less than carload lots. Little business, however, is coming out at either set of prices. Engine bolt and staybolt metal likewise are quoted by some producers at 5.00c to 6.00c as a minimum with one or two others still adhering to 7.50c, the maximum.

Small Tonnages Moving

Philadelphia, Aug. 23.—Steel bar prices are relatively firm at 1.75c. Small tonnages are moving. Iron bars are quoted at 1.70c, and the market is dull.

Market Practically Unchanged

Pittsburgh, Aug. 23.—Little has transpired this week in the cold-finished bar trade which is of advantage to producers. Business still is dormant. While a few small sizes are recorded the tonnage involved is insignificant and finishing departments have a long way to go before it can be said that operations are in any degree satisfactory. A spread in prices is noted with the number of makers quoting 2.50c, base Pittsburgh, in excess of the number still adhering to 2.60c, base Pittsburgh. Not much interest, however, is being shown and the market continues to drag along. Supplies in the hands of machine tool makers and auto accessory manufacturers still are reported large.

Buying Is Light

Cleveland, Aug. 23.—Although buying is not heavy, an encouraging number of inquiries continue to appear in this market. Prices range from 1.70c to 1.75c Pittsburgh. Most of the business is coming from automobile parts manufacturers and those having contracts for car repairs. The automobile situation in Detroit is holding up well, and producers still expect September to show an improvement. Production of motor cars in August will slightly exceed that of July.

Bolt and Nut Demand Is Small; Some Shading

NUT AND BOLT PRICES, PAGE 518

Cleveland, Aug. 23.—Demand for bolts and nuts is reported as somewhat spotty by makers in this district. In the aggregate, however, is understood the market is about the same as it has been for some weeks past, and although prices are reported holding at the established levels it is possible for a large buyer to obtain a good price concession. In the rivet field, however, it is understood a small influx of railroad business has caused the prices, which heretofore have been exceptionally weak, to stiffen.

Shade In Competition

Philadelphia, Aug. 23.—The bolt, nut and rivet markets are unsettled. The larger makers are maintaining their price lists but competition brings out some shading.

Market Lacks Stability

Chicago, Aug. 23.—Discounts on bolts and nuts are not regarded by sellers and practically any figure necessary to take the business is being quoted. Demand is small and for small lots. The total is probably not more than 10 per cent of productive capacity and as a result makers are operating their plants intermittently.

Coke Workers on Strike

Refusal of several hundred employes of W. J. Rainey, Inc., at the Allison plant to accept another wage reducton was responsible for the first strike of coke oven workmen in the Connellsville region since 1902. This occurred last week when a new wage scale was announced allowing skilled workmen a little more than $3 a day for 10 hours. Officials of the company have indicated they will close the plants if the strikers persist.

Demand Increases

In Pacific Northwest—Gradual Resumption of Business Is Noted

Seattle, Aug. 19.—While no large tonnages have developed, an increased demand with continued inquiry has created a better feeling in the local steel market. Small orders are the rule but the trade believes it is on the verge of improved conditions. Jobbers report a noticeable improvement this month. There has been no spurt of business but a gradual resumption towards normalcy. Building activity has served to help general conditions and several large projects are either underway or in immediate contemplation. General repair work is also being done and a partial resumption of work in logging camps, lumber mills and along general industrial lines has created a demand for many products in steel and iron. Light sheets continue in best demand although there is increased interest in the heavier items carried by wholesalers.

While some exporting firms report business is dull, others state some small orders have been received. The Oriental demand centers largely in sheets but there is some interest in pipe, scrap and bars. Reports from the Far East indicate German and Belgian manufacturers are competing actively in that market but local houses believe some business will be placed shortly. Mill representatives state there is little change in the situation here.

The Pacific Coast Steel Co. is operating two mills at present. The demand for bars and reinforcing material has improved although it is said the export business is stagnant. A shipment of angles and bars was recently sent to the Orient but further orders have not developed. The railroads have been in the market for small tonnages of material for repair work but as a rule the roads are drawing from their surplus stocks.

The scrap market is quiet with No. 1 cast iron offering at between $17 and $18. It is a buyers' market and foundries report having purchased under the figures given. One firm shipped a small tonnage of scrap shafting to Vancouver, B. C., this week but an order from China for 1000 tons of plate shearings failed to develop. Although the scrap situation is stagnant and prices weak it is a curious fact that supplies are low and dealers state that should 300 or 400 tons be purchased prices would at once advance $2 to $3 a ton.

The steamer CHARLTON HALL, of the Isthmian Steamship Co., has reached Seward, Alaska, with a cargo of rails and fittings for the Alaska engineering commission. The vessel loaded 5400 gross tons of steel rails at Mobile, Ala. These rails are sufficient to complete the railroad in Alaska. The

steamer also has 375 tons of rail fastenings and 75 tons of railway car repair parts, wheels and other materials.

With $400,000 subscribed by the residents of Washington, a huge steel bridge across the Columbia river connecting Pasco and Kennewick will soon be built. This structure will be a toll bridge and will connect the east and west sections of the state. Plans and specifications have been completed by the Union Bridge Co., of this city, and will be approved by the state highway commissioner. The bridge will be 3236 feet long with two steel spans each 252 feet long and two cantilever arms each of 126 feet. There also will be a suspended arch of 180 feet. The steel spans will total 1410 feet.

Todd Dry Docks, Inc., of this city are making extensive repairs to the Shipping Board passenger liner WENATCHEE on a low bid of $149,600.

During the week jobbers have made no further revision in warehouse prices except the item of track spikes which have been reduced from 5.75c to 5.25c. Today's price list is as follows: Steel bars, 4.00c; shapes, 4.00c; plates, 4.10c; blue annealed sheets, 5.25c; black sheets, 6.25c; galvanized sheets, 7.25c bands, 4.65c; cold rolled shafting, 5.55c; track spikes, 5.25c.

The transpacific rate on steel and steel products has been cut from $5.88 to $5 per short ton but this concession has not stimulated the movement of this cargo. Scrap heretofore has taken the steel rate but as some steamship lines objected to handling scrap in bulk they raised the rate to $8. However, shippers say they still can get space at $5 for scrap.

One exporting firm is figuring on an order for 300 tons of steel rails and fittings for shipment to the Hawaiian islands.

Sheet Tonnage Pending

Philadelphia, Aug. 23.—Approximately 4000 tons of sheets are actively pending in this district. A Wilmington, Del., consumer is inquiring for 1600 tons. While some business is going at 4.00c for galvanized and 3.00c for black, the market is not strong at these levels. Blue annealed is offered at 2.25c.

To Build Plant Additions

Plant, office and warehouse additions costing about $50,000 will be built by the Wrought Washer Mfg. Co. of Milwaukee, manufacturer of wrought iron washers. Contracts have been awarded to Klug & Smith, architects and engineers, 69 Wisconsin street, for a 1-story brick and steel addition, 135 x 180 feet, and a wing, 14 x 89 feet. The plant is situated at Wilcox and South Bay streets. Charles H. Disch is secretary.

Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., declared the regular quarterly dividend of 1¼ per cent on the preferred stock, payable Oct. 1 to stock of record Sept. 17.

Railroads Buying Plates

Largest Sale Aggregates 1300 Tons for 65 Locomotives—Boiler and Tank Builders Place Business—Some Price Shading Noted

PLATE PRICES, PAGE 462

Chicago, Aug. 23.—Demand for steel plates is light and hope for business is based on the car repair program being worked out by the railroads. Should the work now in prospect materialize this fall mills will have a fair tonnage. Some business is being taken from builders of boilers and tanks, though demand for oil storage has fallen off. While 1.85c, Pittsburgh, is the nominal quotation, this is being shaded on occasion and various figures conceding more or less of the freight to Chicago have been named.

Tonnage For Locomotives Sold

Philadelphia, Aug. 23.—On plain material, the 1.85c price for plates can be shaded to at least 1.75c, but on specification plates the market is relatively firm. The largest recent sale involves approximately 1300 tons for 65 locomotives the Baldwin Locomotives Works is to build for Mexico. Others include close to 300 tons for the Philadelphia & Reading railroad, placed largely with a Harrisburg maker, and 125 tons for a local fabricator. It is learned that little plate tonnage will be required for the plant of the Atlantic Refining Co., recently damaged by fire. The eastern maker is operating four mills as against one last week. The situation generally is dull.

Plates Offered at 1.70c

Pittsburgh, Aug. 23.—With the exception of railroad buying, the plate market here is inactive. Railroad purchases are limited to small tonnages, for immediate delivery. Production still is confined to narrow limits. Quotations of 1.85c, Pittsburgh, continue to be submitted generally on the few inquiries current although this price is reported to have been shaded to 1.75c, and in a few cases to 1.70c, base Pittsburgh, where attractive tonnages are involved.

Offer Plates at Concessions

New York, Aug. 23.—With trading in plates quiet, the market is difficult to establish. Several of the larger sellers are quoting a nominal figure of 1.85c, Pittsburgh, but in some quarters 1.75c and 1.90c can be had, this being true especially if a sizeable tonnage is involved. A fabricator in this district is inquiring for 3000 tons of plates, shapes and bars, the plate tonnage being the smallest.

Inquiries for Plates

Cleveland, Aug. 23.—A few inquiries for plates are current in the Cleveland market but sales are light. Car repairers are in the market for small tonnages. Prices range from 1.70c to 1.75c.

Receiver Is Appointed

Receivership for the Mutual Truck Co., Sullivan, Ind., has been asked by Sherman & Pomeroy, Inc., advertising agents, Chicago, and the Electric Steel Co., Indianapolis. It is alleged the truck company is insolvent and owes $85,000. The company is incorporated for $500,000 and was organized about four years ago. Fully $300,000 worth of the stock is owned by residents of Sullivan county.

Pronounced Improvement at Birmingham

Atlanta, Ga., Aug. 22.—While iron and steel companies at Atlanta, Raleigh, Chattanooga and other cities of the South outside of the Birmingham district report some improvement in conditions, operations still are far from normal.

In the Birmingham district, however, conditions are rapidly getting back to normal. The plant of the American Steel & Wire Co., at Fairfield, Ala., is now operating day and night and officials report that demand for steel wire products has increased considerably.

The blooming mill of the Gulf States Steel Co., at Gadsden, Ala., is now operating three days per week.

An order was received recently by the Tennessee Coal, Iron & Railroad Co., for 13,000 tons of steel rails for the Pekin Huanhan railroad, China. Some time ago the Chinese government ordered 12,000 tons of steel rails from the same company for the Manchurian railroad. The Tennessee company also received an order recently from Alaska for 10,000 tons of rails. The Tennessee company has placed an additional battery of coke ovens in operation, only two batteries now being idle.

A fair amount of machinery used in the construction of ships, including boilers, derricks and marine engines, the value of which runs into many thousands of dollars, has been purchased by the J. W. Sullivan Co., New York, from the Foundation Shipbuilding Co., Savannah, Ga.

Declares Dividend

The White Motor Co., Cleveland, declared the regular quarterly dividend of $1, payable Sept. 30 to stock of record Sept. 15. Recent truck sales have been of a satisfactory nature and owing to generally improved conditions directors felt justified in taking this action, it was stated.

The property of the General Ordnance Co., Derby and Groton, Conn., builder of tractors, has been attached for $100,000 by creditors. The suit is said to have grown out of unpaid notes.

Scrap Buying Slows Down

Fewer and Smaller Tonnages Taken, Although Generally Prices Stiffen, Advancing 50 Cents to $1 a Ton—Better Feeling Exists

SCRAP PRICES, PAGE 522

Chicago, Aug. 23.—Little change has taken place in the market for iron and steel scrap, although greater confidence exists; quotations have been increased slightly on some grades and bargains are no longer easy to obtain. Offers by buyers to take material at less than the present announced level excite no interest. Railroads are not yet offering much material from car repairs, but this is expected to make its appearance in a short time. Steel grades are not in demand and rolling mill grades are a drug on the market because of little activity of this class of users. Better operation of foundries has resulted in some buying of cast grades in small lots. The Chicago & Alton offers 700 tons, the Elgin, Joliet & Eastern 250 tons, George W. Jenings 1680 tons and the New York Central a blank list. The Wabash is asking tenders on 100 tons of material from repaired gondolas.

Shipments Settle Down

Pittsburgh, Aug. 23.—The edge appears to be off the scrap market in this district and while a few inquiries are before the trade, shipments have settled down to light tonnages. No. 1 cupola cast has become scarce and while offers of $15.25 per ton have been made, dealers are holding this grade at $15.50 to $16. Valley steelworks appear to be patronizing the market at present and, it is reported, one recently bought a tonnage of compressed sheets at a price understood to be $11.50, Pittsburgh. The price of compressed sheets has tightened somewhat and the market now is quotable at $10.50 to $11 per gross ton. While heavy melting steel is held at $13 to $13.50, and a tonnage recently was turned at higher than the maximum figure, it is questionable whether steelmakers will purchase heavy melting steel at present quotations. One steelmaker refused to buy at $14. Offerings of the railroads are comparatively light. Scrap dealers feel that consumers are buying this scrap direct because little is reaching their yards. The price of railroads coil and leaf springs has strengthened 50 cents and now is quotable at $14 to $14.50. Railroad malleable also has increased, this grade now being quoted at $12 to $13. Heavy breakable cast also has jumped 50 cents a gross ton, the usual quotations now being $14.50 to $15. Knucklers and couplers also register a 50-cent gain, bringing the quotation from $14 to $14.50. The same is true of sheet bar crops which are now held between $12.50 and $13. Steel car wheels now are quoted at $14 to $14.50, an increase of 50 cents over last week's quotations.

Sentiment Is Improved

New York, Aug. 23.—Sentiment in the iron and steel scrap market continues improved, but little new buying and few price changes are reported. An exception is wrought pipe, one inch or more in diameter and two feet or more in length, of which a fair tonnage was sold this week. The price of this grade is up 50 cents a ton to $8 to $8.50, dealers buying price.

Market Is Firm

Cincinnati, Aug. 23.—The iron and steel scrap market here is inactive but firm, recent quotation schedules having been closely adhered to in the face of stubborn efforts on the part of some consumers to obtain concessions. Only a few of the inquiries recently put out, which in the main were regarded as forerunners of more active buying, have been placed on order books and the immediate tonnage movement is light.

Demand Not Active

Buffalo, Aug. 23.—A slight demand exists for scrap here but it is not what could be called an active demand. Prices seem to be steady with no immediate sign of further softening. Some Pittsburgh mills are offering $13.50 for heavy melting steel, and so are Youngstown. This is the equivalent of $11 here. Little material is leaving this district on those offers, as dealers here will pay $11 in some instances. Railroad lists which closed recently obtained $13.50 for heavy melting steel. A few small tonnages of hydraulic compressed have been sold at $10.50, Youngstown. Pittsburgh is offering $8.50 for turnings and $10 for steel shoveling turnings delivered. Mill operation is better that at any time since the beginning of the depression.

Better Tone Apparent

Detroit, Aug. 23.—A more hopeful tone existed in the iron and steel scrap market last week with prices registering better and the general market in a better condition than it has been in several weeks. The upward trend was chiefly manifested in turnings and stove plate. Heavy axle turnings went up from $5.50 to $6 and stove plate was a shade better. Dealers declare a slight decline in burnt iron was not indicative of the future business of the market, and looked for grate bars to do better the first of this week.

Inquiry Is Lacking

Cleveland, Aug. 23.—Little or no material is moving in the Cleveland district although dealers having outside connection note only a slight falling off in business together with an absence of volume of inquiry. Many dealers still complain of difficulty in obtaining certain grades of scrap but with lack of demand prices in some instances have softened.

Prices Spread Increases

Boston, Aug. 23.—Buying of scrap is quiet. Dealers with good grades on hand and who are financially strong are holding for better prices, and in several cases have advanced from 50 cents to $1.00, but there is a fairly large number of dealers unable to hold stocks and this is having the effect of greatly increasing the prevailing price spread Cast scrap previously quoted at from $17.50 to $18.50 has sold during the week at prices ranging from $16.50 to $19. The top figure, however, was reached in an outlying district where freight and the advance in pig iron were factors in the transaction. Wrought pipe has advanced 50 cents as the result of a market developing in Pennsylvania and New York. In other grades, there is practically no change either in price or tonnage moving.

Prices Advance 50 Cents

St. Louis, Aug. 22.—An advance of 50 cents per ton is noted in most grades of scrap iron and steel, although the market is quiet and buying has virtually ceased. Rolling mills and steel foundries are asking for prices on materials, but will not buy at prices quoted by dealers. Slight improvement is noted in foundry operations, although mill operations show no increase. After announcing they would resume operations with 450 men on Sept. 26, the American Steel Foundries has countermanded such orders for its East St. Louis plant and it will remain idle indefinitely. No railroad lists are out this week.

Market Still Lagging

Birmingham, Ala., Aug. 22.—The scrap iron and steel market in the South is still lagging, although dealers believe that when the pig iron market begins showing a better condition there will be improvement for them. Several of the steady consumers of pig iron in this district use scrap in their operations. Stove plate and No. 1 cast are still in fair demand with the quotations of the product showing some firmness. Heavy melting steel lags as long as the Gulf States Steel Co., the principal consumer, has its open-hearth furnaces out of commission. Little change in prices has been made in the past several weeks, the quotations being nominal and dealers reiterating that published prices are only a base on which consumers deal when in the market.

Price Firmness Apparent

Philadelphia, Aug. 23.—While the range in prices on heavy melting steel is unchanged, the tendency is upward. There has been some fair buying of this grade by the Bethlehem Steel Co. for its Bethlehem, Pa., plants. Other grades are unchanged as to price but are firm. Some buying pressure likely would result in a general advance. Some sellers are refusing business in heavy melting steel at current levels.

Warehouse Trade Reports Slight Improvement

WAREHOUSE PRICES, PAGE 518

New York, Aug. 23.—Warehousemen say demand has slightly improved and orders are heavier. August business promises a slight improvement over that of July. Nevertheless there is a slight uneasiness and reports of

German materials coming into the market, lowering of domestic freight rates, and other factors promise to bring about another level of prices before the market gets back to normal. Some warehousemen declare that on fair tonnages the mills are willing to shade prices. This is a tendency they have noted on iron. Therefore business continues slow as buyers are striving to feel out the rock bottom. The warehouses here are buying from the mills gradually but not for more than 30 days in advance. As the warehouses feel out the prices they must pay they feel slightly discouraged and insist upon lower quotations.

Sheets Are Weak

Philadelphia, Aug. 23.—Warehousemen report prices are holding, with the possible exception of blue annealed sheets, concerning which there is some uneasiness. As a general thing, there is a much wider demand for stocks out of warehouse and inquiries have been more numerous and expressed in fair sized tonnages. Furthermore several orders have been executed.

Carload Business Placed

Cleveland, Aug. 23.—Some carload business in sheets was placed with warehouses in this district in the past week, and from the total volume of business, jobbers seem to be considerably encouraged. Some of this carload business was received from a manufacturing interest while the remainder came from the sheet metalworking trade. A jobber here reports he has heard that some mills were shading galvanized sheets approximately $5 a ton, but he has been unable to confirm the report. However, warehouse quotations on sheets of all description, as well as other iron and steel stocks are holding at the levels established some time ago.

Offer Hoops and Bands at Concessions

HOOP PRICES, PAGE 462

Pittsburgh, Aug. 23.—Certain hoop and band makers have attempted to get production on their mills by offering their output $3 to $4 a ton under prevailing quotations although they have not been benefited by much business. Dullness still is noted. The quotation of 2.40c, Pittsburgh, continues to apply although some producers are asking 2.60c base Pittsburgh, the same figure as prevails for hot-rolled strip steel. Inquiries are few and the tonnage entailed in those that are received is not large. The spread between the cost of production and the sale price is so narrow that many producers have become disinterested parties in the field, preferring to wait until they can enjoy a small profit or at least break even.

Concessions Are Made

Philadelphia, Aug. 23.—Bands are weak and concessions of $3 and $4 per ton are being made. They may be obtained at around 2.25c, Pittsburgh.

Sheet Prices Are Shaded

Lower Offers Made in Effort To Close on Some Inquiries Current, but Business Lacks Volume—Jobbers Buying Larger Quantities

SHEET PRICES, PAGE 462

Pittsburgh, Aug. 23.—Not much improvement is noted in the sheet market. Orders which are coming out at present are not averaging over single carload lots and shipments are desired immediately. Jobbers' supplies are low and they are buying slightly larger quantities. Inquiries from the jobbing trade are scattered. Operations of mills show no change. Shipments of 31-gage black sheets continue to be made to Japan, although the demand from this source has fallen off. Little change in price schedules is noted. Some tonnages of black and galvanized have been shipped at a concession recently by certain mills, but the price of 3.00c and 4.00c, base Pittsburgh, for black and galvanized, respectively, usually is quoted. On blue annealed sheets rolled on jobbing mills the price of 2.40c, base Pittsburgh, continues to prevail, although lower than this figure is reported where the tonnage is suitable for schedule on plate mills.

Offer Concessions of $5

New York, Aug. 23.—Quotations on black and galvanized sheets are being offered in several instances at $5 a ton under the market of 3.00c and 4.00c, respectively. At the same time, weakness also prevails in blue annealed which now may be quoted at 2.15c, Pittsburgh. Trading in all descriptions is in small volume.

Demand Steady, Prices Weak

Chicago, Aug. 23.—Sheet users who have been holding off find their assortments broken and are now coming into the market for tonnages. In most instances they name deliveries that mill cannot make, difficulty in placing the business being a result. In a few cases users are asking contracts for third and fourth quarter delivery. Mills, however, are not ready to contract. Nominal prices are unchanged at 3.38c and 4.38c, Chicago, for black and galvanized and 2.63c to 2.78c, Chicago, for blue annealed. Selling is being done on occasion at concessions from this schedule when business is attractive. The Inland Steel Co. is continuing 14 of its 18 mills in operation this week.

Prices Show Easier Tendency

Youngstown, O., Aug. 23.—Inquiries for sheets in the last week increased considerably, coming from a diversified list of consumers, but all makers report a lack of sizeable business placed on their books. While some of the leading producers refuse to go below 2.40c, 3.00c and 4.00c for blue annealed, black and galvanized sheets respectively, at least on the tonnage that is being offered, prices below these figures are being done. Producers admit that lower prices are being offered, while a leading jobber claims to be doing better than 3.75c for galvanized for which some demand in small lots was experienced during the week. Mills holding to the 2.40c, 3.00c and 4.00c level are not booking much business at these figures. In other instances prices are largely a matter of negotiation. More inquiries have been received for automobile sheets than in several months. Some of the smaller makers are offering the base gage of auto sheets at 4.45c, as compared with 4.70c, the asking price of the leading producers in recent weeks. The sheet market generally presents favorable indications in the apparent interest of a number of buyers.

Tin Plate Buyers

Take 45,000 Base Boxes, Some of Which Are For Export

TIN PLATE PRICES, PAGE 462

New York, Aug. 23.—An order for 25,000 boxes of tinplate and others involving 20,000 boxes for export to Mexico and the Orient are outstanding in the local tinplate market. In all cases, the $5.25, Pittsburgh, price was shaded, although this figure still is regarded as the market on the general run of business. In the case of the lot for export, which represented three different orders, the material, it is said, was supplied largely from stock.

Expect Some Improvement

Pittsburgh, Aug. 23.—An improvement in the volume of orders for tin plate is expected although the situation is not far enough advanced to reflect much of a change in operating schedules. Shipments continue to be made against stocks. Sales of production tin plate still are prominent at $5.75 per base box, Pittsburgh, which usually is the going price. Claims are made on many sides that profits are being wiped out at this figure. Material is being sold out of stock as low as $4.75, base Pittsburgh, although the sales usually are found to embrace special arrangements.

The past week brought increased demand from canners, due principally to the fact that the peach crop in California was larger than contemplated. A slight increase in orders from canners catering to packers of sardines on the Maine coast also is noticed.

Expectations are that the demand for tin plate during 1922 will be heavier than at any time for years. It usually is the case during times of depression that the public buys a considerable quantity of canned foodstuffs and this year has been no exception. Despite the fact that large quantities of canned goods were carried over from last year's pack, the the average quantity of canned goods this year is expected to end showing demand has absorbed the surplus and to have been consumed.

Shape Inquiry Still Active

Numerous Small Projects Under 1000 Tons Received by Fabricators for Figuring—New Eastern Requirements Total 10,000 Tons

STRUCTURAL SHAPE PRICES, PAGE 462

New York, Aug. 23.—A decidedly better volume of inquiry is coming out for shapes. One large seller reports that demand in this district so far this month has exceeded that of the preceding three months. New inquiry of the past week involves close to 10,000 tons, included in which are several lots of 1000 tons and over. Awards are coming out a little more freely, the largest recent contract involving 1000 tons for an apartment house in this city, the business going to the Paterson Bridge Co. A lot of 3700 tons for the Bowery Savings bank reported last week as having been place, was awarded to the Hedden Iron Construction Co. Action is expected this week on the award of about 3000 tons for the department store addition of L. Bamburger & Co., Newark, N. J. Early action is also expected in the issuance of specifications on about 7000 tons for the Commonwealth hotel.

The Bridge Builders and Structural society reports structural awards for July aggregating 60,200 tons or 33 1-2 per cent of rated capacity. Further comparisons follow:

Month	Percent	Tonnage
July, 1921	33½	60,200
June	37	66,900
April	31	55,900
March	29	52,300
February	14	25,600
January	18	32,000
December, 1920	26	47,000
November	27	49,200
October	25½	45,600
September	43	77,400
August	40	72,000
July	50	90,400
June	50	90,400
May	61½	110,000
April	68	122,250

Structural Lettings Light

Chicago, Aug. 23.—A lull in structural lettings is apparent and less tonnage was placed in the past week than usual. Lateness of the season seems likely to preclude the probability of much additional tonnage coming out, except for small projects. A number of important structures which will require large tonnages are being held over to next year. Some unusual quotations for materials fabricated or erected have been made recently, indicating a low price on plain material. The nominal quotation is 1.85c, Pittsburgh, but this seems to be shaded in many instances.

Watch Hangar Letting

St. Louis, Aug. 22.—Local fabricators are keenly interested in the airship hangar to be erected by the government at Scott field, Bellevlle, Ill. The letting will be on Sept. 15, and 3000 tons are involved. No letting has as yet been made for 450 tons of bars for the First National bank, San Antonio, Tex.

Outlook Is Brighter

Pittsburgh, Aug. 23.—While structural awards this week were confined to only a few sizable jobs, those engaged in fabricating work see better signs ahead. They report a large number of jobs up for consideration. The tonnage of shapes involved is not large but they feel the outlook is more encouraging. The largest award current this week is 800 tons for construction of school No. 54 at Brooklyn, N. Y. which went to the McClintic-Marshall Co., Pittsburgh. Another award made this company involves 484 tons let by the Providence Steel & Iron Co. for the new Le Roy theater at Providence, R. I. Several structural awards of small tonnages for garages and crane runways also are current this week. Prominent producers of structural shapes still quote 1.85c, Pittsburgh. Some makers are shading this price to 1.70c and are reported as sharing lightly in the small lettings. Bids for the construction of the bridge across the Allegheny river at Sixteenth street, Pittsburgh, will be opened Aug. 29. The tonnage involved will approximate 5000 tons.

Await Office Building Award

Cleveland, Aug. 23.—In an otherwise dull market here, interest is being shown by fabricators in a 1500-ton office building for the Detroit street railways and in 180 tons for a bridge over the Cuyahoga river near here. No other sizable projects have come out. During the week 1000 tons were awarded to the American Bridge Co. for a warehouse at Manistee, Mich., and 250 tons to the Whitehead & Kales Iron Works for a car house at Detroit. Announcement of a proposed suspension bridge over the Detroit river at Detroit has failed to interest local fabricators who feel plans for the project are too indefinite for actual estimation. As far as can be learned prices are being maintained.

Shade on Desirable Business

Philadelphia, Aug. 23.—Structural shapes are quoted nominally at 1.80c Pittsburgh with concessions of 5 to 10 points on desirable business. The Phoenix Bridge Co. closed on 1000 tons for an office building in Houston, Tex. Philadelphia is inquiring for 1000 tons for a pier. The Philadelphia & Reading railroad wants 100 tons for car repair work.

CONTRACTS AWARDED

School building No. 54, Brooklyn, N. Y., 800 tons to the McClintic-Marshall Co.

Le Roy theater building, Providence, R. I., 484 tons to the McClintic-Marshall Co.

Bushwick telephone exchange, Brooklyn, 450 tons, to Eidtlitz & Ross.

Building for Bowery Savings bank, Forty-second street, New York, 3700 tons, to Hedden Iron Construction Co.

Office building, Trenton, N. J., 200 tons, to the American Bridge Co.

Highway bridge over the Mystic river, Connecticut, 450 tons, to the American Bridge Co.

School building, Jeannette, Pa., 250 tons, to the American Bridge Co.

Allerton house, New York, 1000 tons, to the Paterson Bridge Co.

Municipal aqueduct, 134th street, New York, 350 tons, withdrawn.

Residence for M. Friedsan, New York, 100 tons, awarded to the Hinkle Iron Co.

Department store building, Faris & Walker, Los Angeles, Cal., 3271 tons, to American Bridge Co.

Train shed and umbrella shed for Northern Pacific Terminal Co. of Oregon, 136 tons, to Oakland, Cal., fabricator.

Group for St. Elizabeth's hospital, Lafayette, Ind., 205 tons, to Indiana Bridge Co., Muncie, Ind.

Car house, municipal street railway, Detroit, 250 tons to the Whitehead & Kales Iron Works.

Warehouse, Manistee, Mich., 1000 tons, to the American Bridge Co.

Office building, municipal street railway, Detroit, 1500 tons.

Office building, Houston, Tex., 1000 tons; Phoenix Bridge Co.

CONTRACTS PENDING

High school building at Omaha, Nebr., 1700 tons, bids in, award pending.

Music hall and auditorium, College of Industrial Arts, Denton, Tex., 225 tons, bids in.

Building for San Jacinto Life Insurance Co., Beaumont, Tex., 1000 tons, bids asked.

School building, Syracuse, 350 tons, bids being asked.

School building, Meadville, Pa., 350 tons, bids being asked.

State highway bridge, Trenton, N. J., 500 tons, pending.

Municipal pier, Philadelphia, 1000 tons, pending.

Office building for New York & Queens Electric Light Co., Flushing, L. I., 200 tons. Bids being asked.

Office building, Washington and Liberty streets, New York, 500 tons, pending.

Theater and office building, Philadelphia, 1500 tons, pending.

State project, Aqueduct, N. Y., 300 tons, bids being asked through general contractor.

Apartment house, Jackson Heights, L. I., 1000 tons, pending.

Warehouse for Macy & Co., New York, 1100 tons, pending.

Office building for H. Mandel, near Forty-second and Park avenue, New York, 300 tons.

Office building, West Twenty-fifth street, New York, 400 tons, pending.

Building for Automotive Engineers club, New York, 700 tons, pending.

Building for Queensboro Gas & Electric Co., Far Rockaway, L. I., 100 tons, pending.

Commonwealth hotel, New York, 7000 tons, specifications to be issued shortly.

Office building for National Surety Co., Washington street, New York, 500 tons, pending.

Car repairs, Philadelphia & Reading railroad, 100 tons; bids asked.

Bridge over Cuyahoga river at Alexander near Cleveland; Cuyahoga county commissioners opened bids Aug. 24.

Municipal pier, Philadelphia, 1000 tons; bids asked.

Concrete Bar Sales Are Few; Prices Weak

Pittsburgh, Aug. 23.—While it is reported makers of reinforcing concrete bars are submitting under 1.75c, Pittsburgh, on their product, this condition does not prevail generally. In some cases extras for deformation are being waived but the price of 1.75c, Pittsburgh, usually is the quotation submitted. Sales still involve small tonnages and there is little business pending to command attention. Makers feel optimistic as to future requirements and are keeping up courage in hopes of an increased demand.

Some Bars Are Sold

Philadelphia, Aug. 23.—Small scattered lots of reinforcing concrete bars are moving at 1.65c to 1.70c, Pittsburgh.

Trading is Slack

New York, Aug. 23.—This is a slack interval in the trading in concrete bars. Inquiries are much slower than they were a few weeks back and the market is decidedly weak. Nevertheless the price of 1.75c nominally holds, this being the price quoted on plain and concrete bars. There is no extra for deforming. During the past

week the Lehigh Valley railroad purchased 100 tons of bars, which was the only order of any size reported in the market. The price on this tonnage was special.

Wire Buyers

Taking Tonnages While Prices Generally Are Holding Steadily

WIRE PRICES, PAGE 462

Chicago, Aug. 23.—As in no other department of the steel market, wire and nail quotations are holding with great firmness and shading is not now encountered. Buyers, especially jobbers, seem to have gained confidence in the situation and are ordering more freely. Jobbers seem willing now to build up their stocks. As a result heavy orders, compared with business of the past several months, are being booked by wire and nail makers. This is true of nails of all kinds, barbed wire, fencing and netting. Manufacturers are not yet taking much wire as a demand for their products not yet has revived. Most shipments are being made promptly, as mills have accumulated a good assortment in reserve.

Mill operation is increased materially in the past few weeks. Firmness of prices may be judged from a recent incident when 8000 kegs of nails offered a maker at $2.50 was refused.

Report 2.75c Shaded

New York, Aug. 23.—While some fair sized lots of bright nails are being sold in this district at 2.75c, Pittsburgh, reports of shading persist. In one case, it is said that a lot of 1300 kegs has been sold by a domestic maker at 2.50c, Pittsburgh, but this has not been confirmed. Offerings of foreign nails are being made at 2.50c, New York. Trading in wire is listless with the market holding nominally at 2.50c, Pittsburgh.

Demand Is Better

Pittsburgh, Aug. 23.—This week registered a slightly better showing in the demand for wire and wire products, mills reporting an improvement in the number of inquiries and a better feeling among the trade generally. While no unusually large orders are current, those coming from the jobbing trade indicate a tendency to replenish stocks and this is being done in a casual way. Reports are current of German competition in the wire market but little alarm is felt over the movement on account of the quality of the material being inferior to the product coming off American mills. A sample of wire representing a German shipment now on the Atlantic was received recently by a Buffalo consumer and the test to which it was subjected showed such poor results that rejection now seems probable. Plain wire is being quoted at 2.50c, base Pittsburgh, with the number of bundles confined to narrow limits. Wire nails are quoted at 2.75c, Pittsburgh.

Bright Nails Move

Philadelphia, Aug. 23.—Fair business in bright nails is going at 2.75c Pittsburgh, with the market apparently firm. Wire is dull and unchanged.

Car Repairs Total 4500

New Inquiries Continue To Come Out While Placements Aggregate 2600 —Parts Are Wanted—Roads May Buy Track Material

RAILROAD TRACK MATERIAL PRICES, PAGE 462

New York, Aug. 23.—Further car repair business features the railroad market. Buffalo, Rochester & Pittsburgh is inquiring for repairs on 700 gondolas and 500 hoppers, and is making repairs in its own shops at Du Bois, Pa. on 500 box cars. The Illinois Central is inquiring for repairs on 800 freight cars, and the Pere Marquette continues to figure on the repair of 1000 box cars. The Erie has awarded a contract for the repair of 400 box cars to the Illinois Car Co., and the Chicago Great Western approximately 200 box cars to the Ryan Car Co.

Some small car orders have also been placed. The White Coal Co. has purchased 50 mine cars from the Pressed Steel Car Co. and the Atlantic Fruit Co. 100 cane cars from the Magor Car Co. The Argentine Ministero De Obras Publicas is reported to have asked for new bids on 70 broad gage freight cars for use on the port railways. It is said that bids will be closed on Sept. 2.

The Seaboard Air Line is inquiring for 28 locomotives including 10 switching engines.

Requirements Are Light

Pittsburgh, Aug. 23.—Sizable orders for light rails are a rarity, it being difficult to find requirements averaging in excess of 50 to 100 tons. On account of the prevailing dullness, some makers maintain they are not justiged in meeting competitive prices of 1.75c and 1.80c, and hence are continuing to hold their product at 1.85c. Pittsburgh, for trackage weighing from 25 to 45 pounds per running yard.

The demand for relaying rails is weak and this market certainly does not reflect any increase in the demand for this commodity as is reported as coming from operators of coal mines. Railroads still are confining their purchases of spikes and tie plates to quantities sufficient to cover repair work about to be undertaken. Tie plates come under the usual quotation of $45 to $50 a ton, while standard spikes are offered between 2.70c and 2.85c, Pittsburgh. While several railroads have put out inquiries for track bolts lately, they have resulted in the placing of only a little business.

Car Repairs in Prospect

Chicago, Aug. 23.—Preparations for repair of freight cars are going forward, both in railroad shops and in plants of car builders. This provides a prospective tonnage of finished steel for the near future. The Chicago, Burlington & Quincy, which is required to advertise all its lettings, is in the market for about 600 tons of pressed steel parts for gondola repair. The Pere Marquette will ask bids shortly on repairs for 1000 box cars. The Rock Island is asking for repairs for 500 all steel service gondolas. The Chicago Great Western has let repairs on 200 box cars to the Ryan Car Co. The Rock Island is asking bids on 200 gondolas of 50 tons capacity.

Spikes and bolts are being shaded and it is understood they are available at 2.50c to 3.50c, Chicago.

May Buy More Tie Plates

St. Louis, Aug. 22.—The Missouri Pacific has an inquiry out for 20 bodies and fire boxes, and the Rock Island is figuring on 200 50-ton composite coal cars. The Missouri Pacific is expecting to place orders in October for tieplates, in addition to the orders placed last week for 3000 tons. Business is improved and there is a decidedly better feeling among the trade.

The Big Four has placed an order to repair 1500 cars with the American Car & Foundry Co., Madison, Ill.

Buys Track Bolts

Philadelphia, Aug. 23.—The Philadelphia & Reading railroad has placed 750 kegs of track bolts and is inquiring for 100 tons of structural shapes for car repair work.

Plan Bridge at Detroit

Construction of a highway and railroad bridge across the Detroit river at Detroit is contemplated in the organization of the American Transit Co. and the Canadian Transit Co. to jointly finance and build the structure. It is expected work will be begun in 1922. The bridge is to cost $30,000,000; to have a span of 1803 between centers of piers; to clear the water 110 feet; to have two decks with provision for street car, vehicular and pedestrian traffic as well as railroad space.

The design and construction of the bridge is being handled by Charles Evan Fowler, New York, consulting engineer. He is chairman of a board of engineers in charge of the project, included among whom are George H. Pegram, and William H. Burr, of New York; Prof. C. R. Young of Toronto and C. N. Monsarrat, Ottawa, Ont.

British Firm Low Bidder on Bombay Pipe Line

London, Aug. 22.—(By Cable)—The lowest bidder for the 100-mile water pipe for Bombay, India, is Braithwaite & Co., Calcutta, representing Dorman, Long & Co., steelmakers, Middlesbrough, Eng., according to an announcement at Bombay. The pipe will require 72,000 tons of plates. Braithwaite & Co. bid 25,600,000 rupees, equivalent to about $6,225,000, this to include erection. Sir John Jackson bid 35,000,000 rupees. The lowest American tender was 37,700,000 rupees.

Semifinished Market Dull

Pittsburgh Maker Takes Tonnage of Sheet Bars for Valley Consumer at Less Than $32, Delivered—Prices Generally Untested

SEMIFINISHED STEEL PRICES, PAGE 462

Pittsburgh, Aug. 23.—Quietness continues in the semifinished market here, and little tonnage of any grade is offered for negotiation. A consignment of sheet bars is understood to have been sold by an independent steelmaker here, who generally is not a factor in the sheet bar market, to a valley sheet maker at a price said to be slightly under $32, delivered. This sale was made in competition with a valley sheet bar maker whose freight rate to the nearby sheet consumer approximated 25 cents. The freight rate absorbed by the Pittsburgh interest totalled approximately $1.60. While not much business in this direction is pending, indications are that in two weeks or a month increased activity will be noted. This at least is the opinion of one maker who is in close touch with the sheet bar market. While $32, Pittsburgh, is the usual quotation on both grades of sheet bars, in trade circles it is not unusual to hear the statement that $30, Pittsburgh, would be made on fairly attractive tonnages. There is not enough going business, however, to put prices to a test; producers merely marking time and holding to $32 in the absence of business. As far as can be ascertained, no inquiries for billets and slabs have been put out in the past week. The market for rerolling billets still is weak and a lack of inquiry is noted in this direction. The same applies to wire rods. Not much inquiry is noted, and while $42, Pittsburgh, still continues to be the leading quotation it is understood $40, Pittsburgh, could be done. Skelp continues to be a drug on the market and business easily could be placed at 1.75c to 1.85c.

Market Test Lacking

Youngstown, O., Aug. 23.—Not enough business is being offered producers of semifinished material to test prices, and $32, Youngstown is being done on the few small tonnages of sheet bars which are being booked in this district. Specifications against contracts have increased slightly. There is no new demand for either billets or slabs. Billets of 4 x 4 inches and larger are quotable at $30 and slabs at $31, Youngstown.

Light Trading in East

Philadelphia, Aug. 23.—Trading in billets and sheet bars is light, especially the latter. Prices are nominal and unchanged. Reports are heard that wire rods have been sold at $35 to $36, Pittsburgh.

Suit has been filed in the United States district court of New Jersey by the American Foundry Equipment Co., Inc., 366 Madison avenue, New York city, against the Stokes Mfg. Co., Dover, N. J. It was alleged that an infringement was made by the Stokes company on machines for cutting and mixing foundry sand, and an injunction was asked restraining the compay from the further manufacture of their machines. Damages were also asked.

Better Demand

For Standard Pipe—Other Grades Are Quiet—Cast Prices Soften

PIPE PRICES, PAGES 462 AND 518

Pittsburgh, Aug. 23.—An improvement in the demand for standard steel pipe is current and while individual tonnages are not large, the aggregate is sufficient to reflect a decided betterment in the general tone. Oil country requirements still lack interest although hope is entertained that when manufacturing companies get their plants under way again the demand for this product will come to the front. Discounts on standard pipe are being well maintained although those applying on line pipe and oil country goods are slightly off, makers finding considerable competition in the field and a desire to get business on every hand even with the shading of prices. The demand for wrought iron pipe also is weak with occasional orders aggregating a few carloads from widely scattered centers.

Prices Are Lower

New York, Aug. 23.—Following several sales recently at marked concessions, the market on cast iron pipe has fallen to a New York base of $48.30 on 4-inch pipe and $43.30 on 6-inch pipe and over. However, with pig iron apparently on the upward trend, some trade interests are of the opinion higher prices on pipe may again develop shortly. But for the present at least it is admitted even the recent low levels can be shaded were desirable tonnages involved. On a small tonnage for Yonkers, the United States Cast Iron Pipe & Foundry Co. was awarded the contract on a price of $41.90, delivered. No action has as yet been taken on the 500 tons for Scarsdale, N. Y., and aside from this tonnage little is pending in the way of municipal business. Private demand is only fairly active.

The Foundation Co., this city, is inquiring for 215 tons of steel pipe for foundation work.

Good Late Season Business

Chicago, Aug. 23.—Although the time remaining for laying cast iron pipe is relatively short, cities still are inquiring for fairly important tonnages for this year's work. On the whole, inquiries are not heavy but represent a fair volume of business for the season. Delay in closing is still noticeable, as even present prices are considered high and buyers tend to expect concessions. Prices are being shaded on important lots and pipe can be covered considerably under the announced quotation. The United States Cast Iron Pipe & Foundry Co. has been awarded 800 tons at Des Moines, Iowa. Hammond, Ind., has not yet awarded 3000 tons on which it has opened bids, being still undecided as between iron and wood pipe. Bids will be opened at Bloomington, Ind., Aug. 23, on 50 tons; at Youngstown, O., Aug. 31, on 1500 tons, at Sidney, O., Sept. 2 on 1000 tons, and at St. Paul, Sept. 5, on 500 tons. Detroit will open bids today on 1500 tons readvertised. James B. Slow & Sons, Chicago, are the successful bidders for furnishing Two Rivers, Wis., with 6000 lineal feet of 6-inch and 800 feet of 4-inch class C cast iron water pipe. Prices are: 6-inch pipe, $46.85 per ton; fittings, $112.40 per ton; 4-inch pipe, $49.85; fittings, $122.40 per ton.

Pipe Prices Stiffening

Birmingham, Ala., Aug. 22.—Concessions on cast iron pipe prices are not so easy and there is a stiffening of quotations, a minimum having been struck around $35. Pipe is being shipped from Birmingham now steadily on business which has been coming in for the past two months and longer. The National Cast Iron Pipe Co. has a large bunch of orders ranging from 100 to 500 tons and more on which work is being done, the plant being almost in full operation. The American Cast Iron Pipe Co. also has been successful in lettings lately and is operating steadily. With the quotations for pipe stiffening, there is every reason for believing that a steady pipe trade can be expected.

Alloy Inquiry

Continues in Broader Volume—Prices on Most Grades are Unchanged

FERROALLOY PRICES, PAGE 518

New York, Aug. 23.—The broader volume of inquiry for ferroalloys reported last week continues, main interest being in ferromanganese. Quotations for ferromanganese are unchanged at $65, c.i.f. Atlantic port on 76 to 80 per cent foreign alloy, and $70 delivered on 78 to 82 per cent domestic alloy. Some offerings of ferromanganese for shipment from England at lower prices continue to be made, one lot of 500 to 600 tons being offered at $57 c.i.f. Atlantic port, and another at $61, c.i.f. Spiegeliesen is holding steady at $25 to $26. Several consumers have been inquiring for ferrotungsten, probably with a view to the tariff. In the aggregate the inquiry for tungsten probably exceeds 100 tons of contained metal. The nominal price is about 40c a pound contained. Offerings were made last week at 36½c. The market for 50 per cent ferrosilicon remains about $60 to $65, delivered, with several of the domestic makers refusing to compete. Ferrovanadium has been moving a little more freely, the leading interest reporting better shipments in July than for any month this year. The leading interest is maintaining its price of $5 a pound contained on high silicon alloy, while outside sellers are doing business in low silicon alloy down to $4.50 a pound contained.

Price Fails to Attract

Philadelphia, Aug. 23.—Activity in ferroalloys is centered in ferromanganese.

The domestic price of $70 is failing to get business. Demand for this product is more active, but no large inquiries are involved. Other alloys are dull and unchanged.

Market Steel Dull

Pittsburgh, Aug. 23.—Dullness continues in the ferroalloys market with only a few inquiries to command the attention of producers. A West Virginia steelmaker is in the market for a carload each of 76 to 80 per cent ferromanganese and 50 per cent ferrosilicon. Business still under negotiation includes a carload of ferromanganese wanted by the Detroit Steel Casting Co., and from 200 to 300 tons of ferromanganese by Youngstown steelmakers for delivery over the next two months. Three producers are quoting $73, delivered, on 74 to 78 per cent ferromangansee, $74 on 76 to 80 per cent, and $75 on the 78 to 82 per cent grade. In other directions, however, a more attractive price is heard and firm offers of $70, delivered, are not being refused. While the quotation of $65, delivered, on 50 per cent ferrosilicon usually prevails, this price recently was shaded $5 a ton on resale single carload in the Middle West. Some less than carload inquiries are out including one for three quoted $90, f.o.b. cars Rahway, N. J. tons packed in bags on which was Another small lot was quoted at $82, delivered, but the business was placed elsewhere at $75, delivered.

Delay Import Regulation

Toronto, Can., Aug. 22.—Enforcement of the customs act, amended at the last session of parliament to provide that all goods imported into Canada shall bear the name of the country where they were manufactured has been delayed until Dec. 31. It was originally provided that this regulation should become effective Oct. 1. The importers have been urging delay in putting the rule into effect on the ground that much merchandise already has been purchased and some of it packed and that marking in its present condition would be impossible.

To Study Coke Properties in South

A study of the physical properties of coke in relation to its production and use in the blast furnace is to be made by G. St. J. Perrott, associate physical chemist of the United States bureau of mines experiment station at Pittsburgh, who is to be sent to Birmingham, Ala., for that purpose. Some blast furnace operators have said there is a decided lack of knowledge regarding the physical and chemical properties of coke in producing iron ore. In the stress of wartime they found it necessary to use almost anything in the way of coke material that was offered, and, it is said, they found they could use materials that before seemed impossible. It is believed by the bureau that the investigation proposed offers a fertile field. Conditions are very favorable for the conducting of these investigations at the Tuscaloosa experiment station of the bureau, where there are a number of small blast furnace and by-product plants.

The Nonferrous Metals

Metal Markets Show Improvement—Copper Is Quoted at 12 to 12.25c, Delivered—Exports Encouraging—Little Activity in Tin Market

	Copper Electro delivered	Copper Lake delivered	Spot Straits New York	†Lead New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Nickel shot
Aug. 17.....	12.00	12.00	25.62½	4.40	4.20	20.00	4.55	40.00
Aug. 18.....	12.00	12.00	25.87½	4.40	4.20	20.00	4.50	40.00
Aug. 19.....	11.87½	12.00	26.00	4.50	4.20	20.00	4.50	40.00
Aug. 22.....	11.87½	12.00	26.25	4.40	4.17½	20.00	4.50	40.00
Aug. 23.....	11.87½	12.00	25.87½	4.40	4.17½	20.00	4.50	40.00

†Open market quotation.

NEW YORK, Aug. 23.—Copper and zinc prices have reacted slightly, reflecting the pressure of heavy stocks and the less favorable tendency in the London markets. Lead has been firm, with a good volume of business the past week. Tin broke 26.00c to 25.62½c. This was the lowest price in 18 years. Antimony and aluminum also have been quoted at low prices. Despite the general weakness of the markets, the improvement in sentiment previously noted has continued and the volume of business has been somewhat broader.

The decline in the value of the German mark and the recent weakness of the pound sterling have decreased the London copper price in terms of American exchange to about 12.00c, London. As there have been offerings at close to this level, export sales by American interests have been light and copper again has backed into the domestic market. Whereas a week ago electrolytic was firm at 12.00c, delivered, with some sellers asking 12.12½c, for prompt, it again is possible to buy at 11.87½c, delivered. Export shipments from Atlantic ports have been about 20,000,000 pounds thus far in August. Casting copper prices are steady at 11.37½c to 11.50c. Lake copper is quoted 12.00c, delivered.

When tin declined to 25.62½c some consumers entered the market and bought about 300 tons of Straits. This news extended some encouragement to London and the British market's decline was checked. Prices here recovered to 26.00c to 26.25c. Sentiment has been bearish as to tin, on both sides of the water. Ninety-nine per cent tin has been rather scarce for spot delivery and the price has been only ½c to ¾c below Straits. During August arrivals have been 1785 tons; tin afloat to this country is estimated at 3030 tons. Arrivals of Bolivian ore have been 900 tons.

A large amount of lead business has been done, quietly, this month, at the established prices of 4.25c, East St. Louis, 4.40c, New York, for prompt, and September shipment. Mexican lead prices range from 3.70c to 3.75c, in bond. Foreign advices continue cheerful as to the lead situation and a fairly good export business in Mexican lead is being done.

Most sellers of prime western zinc have been maintaining a price of 4.20c, East St. Louis. However, sales were reported Aug. 22 at 4.15c, East St. Louis, for prompt shipment. This is probably a repetition of movements in previous months, when sacrifice sales were made by some speculators who were forced to specify before the new month begins. High grade zinc has been moving relatively better, quotations ranging from 5.75c to 6c, New York.

Virginia ingot aluminum, 98 to 99 per cent, again was obtainable for importation at 19c, duty paid, New York, this week, buyer to provide letter of credit, while spot could be bought from some sellers at 20.50c. Other holders of spot have continued to ask from 22.50c to 24.50c. The American producer is maintaining a price of 25c. No. 1 remelted is quoted 18c to 19c and No. 12 remelted 16c to 17c. The market is quiet.

Mill Products

SHEETS	
Copper, hot rolled, 24 oz., minimum	19.75 to 20.00
High brass	15.75
Zinc, ga. 9 to 18 (plates ½c less)	10.00
Lead, full sheets (cut ¼c more)	7.75
SEAMLESS TUBES	
High brass	18.50
Copper	20.00
RODS	
High brass, round, ⅛ to 2½ in.	13.75
Naval brass rod	16.75
WIRE	
Copper	14.00
High brass	16.75

Old Metals

HEAVY RED BRASS	
Chicago	6.50
Cleveland	7.50 to 8.00
New York	7.50 to 8.00
HEAVY YELLOW BRASS	
New York	4.50 to 4.75
Chicago	5.25
Cleveland	4.50 to 5.00
ZINC	
New York	2.50 to 2.75
Cleveland	1.50 to 2.00
Chicago	2.00
HEAVY COPPER AND WIRE	
Cleveland	8.00 to 8.50
Chicago	8.50
New York	9.00 to 9.25
RED BRASS TURNINGS	
New York	6.25 to 6.50
Cleveland	5.50 to 6.00
Chicago	6.00
YELLOW BRASS TUBING	
Cleveland	3.50 to 4.00
NO. 1 BRASS ROD TURNINGS	
Cleveland	3.50 to 4.00
New York	4.00 to 4.25
Chicago	4.00
ALUMINUM BORINGS	
Cleveland	4.50 to 5.00

Mill Operations

Show Decrease In Valley—Improvement Noted in Other Centers

Youngstown, O., Aug. 23.— A decrease in operations of both sheet mills and open-hearth furnaces in the Mahoning valley is noted this week. Reports show only 42 of the 105 sheet mills were operating today, as compared with 53 last week. This is largely accounted for by the fact that the Youngstown Sheet & Tube Co., which last week was operating nine took them all off at the beginning of this week. The Sharon Steel Hoop Co., which had seven in operation last week reduced this week to four. The Newton Steel Co. and Brier Hill Steel Co. each has 10 in operation; the Trumbull Steel Co., seven, the Republic Iron & Steel Co., six; and the Mahoning Valley Steel Co., five. The Falcon Steel Co., is planning on an early resumption of its sheet mills, all now being inactive.

Twenty-six open hearths are being charged as compared with 28 last week. The Republic Iron & Steel Co. reduced from eight to six and the Youngstown Sheet & Tube Co. from seven to six. The Brier Hill Steel Co. is operating nine; the Trumbull Steel Co. two and the Sharon Steel Hoop Co. three.

The Sharon Steel Hoop Co., resumed the operation of its blast furnace this week, while it is reported that No. 4 furnace of the Carnegie Steel Co., was blown in Monday, stacks Nos. 4, 5 and 6 now being in blast.

The Youngstown Sheet & Tube Co. has increasad operations in its pipe department putting on eight of its 11 mills. The company's rod mill is not operating, and its bessemer plant also is idle.

Continue Operations on Improved Basis

Mill operations in Ohio continue to reflect the slow but steady improvement in the steel trade. Officials of the Follansbee Bros. Co., Toronto, O., announced that operations will be started about Sept. 15. Open-hearth furnaces will be lighted, giving employment to 200 or more men. About 200 men now are at work on plant construction. The entire plant will be in operation about Oct. 1.

Fourteen mills of the Stark division of the United Alloy Steel Corp. were started Monday night. These mills were in operation part of the time last week. Six of the eight mills will continue operation at the plant of the Superior Sheet Steel Co. Canton, O. This plant has been operating at 75 per cent of capacity since Aug. 1.

The plants of the Timken Roller Bearing Co., at Canton, and Canton Sheet Steel Co., will operate this week on practically the same schedules as last week.

The six mills operated last week by the Reeves Manufacturing Co., New Philadelphia, O., will be continued during this week, officials announced.

Approximately 1000 men in the Canton district are affected by the ruling of the United States labor board, upholding the principle of time-and-a-half payment for overtime in all railroad shops.

Alabama Mills Increase Their Output

Birmingham, Ala., Aug. 22.—The plants of the Tennessee Coal, Iron & Railroad Co., subsidiary of the United States Steel Corp. are operating at more than 50 per cent of capacity. A good start has been made on the order recently received for 13,000 tons of rails for a Chinese railroad, and on other products. The American Steel & Wire Co. another subsidiary of the Steel corporation, is speeding up operations at its Fairfield plant, and the Gulf States Steel Co. an independent company, is increasing its output of steel wire and nails.

The CHATTANOOGA CITY, fourteenth and last of the big steel ships to be built by the Chickasaw Shipbuilding & Car Co., Mobile, with steel produced and fabricated in Birmingham, will be launched Sept. 12. The other boats have been making regular trips to the Far East and elsewhere, carrying products of the Birmingham district. The Tennessee Coal, Iron & Railroad Co. is shipping large quantities of steel rails, plates and shapes to China, Japan and other sections of the world.

Labor Alliance Near End

London, Aug. 11.—The great British triple alliance of labor appears at the point of total collapse. Only four months ago it was getting ready to bring about a revolution in England, but when the test came it failed to function and the purposed triple alliance strike in support of the coal miners, originally scheduled for Friday, April 15, was called off at the last minute. Since then the coal miners themselves have been compelled to return to work at lower wages. It is now announced that the triple alliance will go out of existence early in September. Whether some substitute organization can be formed in British labor circles to take its place depends on what happens at future general labor conferences, but it is officially announced that for purposes of action, direct or otherwise, the triple alliance will soon cease to function as a trade union entity.

Ready To Lay Water Line

Tampico, Mexico, Aug. 22.—All that is lacking for beginning construction of the great water supply system for Tampico is formal permission of the city council to lay the mains in the streets, according to E. E. Thomas, head of the Compania Abastecedorado Agua Potable de Tampico, which has been formed to carry out the project. The cost of the works will be approximately $8,000,000 United States money. The company is composed of American financial interests, it is stated. Concessions for piping the water to Tampico and the terminals of the various oil companies have been obtained from both the federal and state governments. The water will be brought from Micos Falls, in the state of San Luis Potosi, 102 miles distant, flowing by gravity through a 16-inch pipe line to a stand pipe or reservoir to be erected in the city.

Plan To Reopen Plant

The plant of the Youngstown Steel Car Co., Youngstown, O., plans to resume operations some time this week, affording employment to 250 men. Operation schedules of the General Fireproofing Co., the Truscon Steel Co. and the Republic Rubber Co. are unchanged.

Forgings Plant Is Closed

The Harley Co., Springfield, Mass., drop forgings and castings, which is owned by the Hendee Mfg. Co. of that city, shut down recently and will probably never again be operated by the latter. It is expected it will be placed on the market shortly. Several months ago the Hendee Mfg. Co. filed a so-called friendly attachment of $700,000 against the Harley Co., which caused other creditors to bring suits, though the plant continued in operation under curtailed conditions.

The J. Stevens Arms Co., Chicopee Falls, Mass., increased its operating schedule to four days a week recently.

More British Furnaces Resume

Pig Iron Prices Lower as Operations Continue To Increase—Manufacturers Now Successfully Meeting Continental Competition—Belgian Mills Book 40,000 Tons of Rails for Home Railways—More Strikes in Germany

The Iron Trade Review Staff Cable

European Headquarters,
THE IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

Sterling—$3.66

LONDON, Aug. 22.—Nine more stacks have been blown in, and British pig iron prices this week are lower. Other resumptions include a Birmingham skelp mill, several iron mills and sheet mills. Continental competition is being met more successfully by British manufacturers, especially in semifinished material. Revised figures isued in regard to British output in July are as follows: Pig iron, 10,200 tons; steel ingots, 117,200 tons. The operation of steelworks is increasing slowly.

Steel scrap has been sold down to £2 ($7.32) per ton. The price of shapes has been reduced £1 ($3.66). India is buying galvanized sheets at £24 ($87.84) c.i.f. Calcutta, while Japan is buying thin gages at £30 ($109.80) f.o.b. Cardiff. India also is buying tin plates.

American mills are selling mattress wire in Great Britain, and merchants are trying to book ahead at present prices. French mills are exporting rails at 330 francs ($24.09) per metric ton. Belgian mills have booked 40,000 tons for the home railways. Belgian metallurgical coke is quoted at 90 francs (6.57) per metric ton.

A few more strikes are reported in Germany. German quotations appear to be firmer, as follows: Sheet bars, 1700 marks; ($22.10); plates, 2000 marks ($26); bars 2300 marks ($29.90) and plain wire, 2100 marks ($27.30).

British Mills Profit by Belgian-German Price War

European Staff Correspondence

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,

Sterling—$3.58

BIRMINGHAM, Eng., Aug. 11.—The feature of vital importance in the British iron trade is the continued idleness of blast furnaces. About 300 still are down and most of these will remain so for some months. It is reported that one or two are starting in Scotland. Five are operating in northeastern Yorkshire and two others will start soon; and another furnace in North Staffordshire will resume next week, making a total of about 12. The Whitehaven Hematite Iron & Steel Co. is to start one of its Cumberland furnaces in a few days, the first to be relighted in the Furness district.

Coke makers have been bombarded with inquiries as to prices. One or two makers have shown anxiety to come to an understanding, in order to operate their idle ovens. A firm in Wales got in touch with a Staffordshire smelter. Welsh coke is of superior grade, but the price of £2 17s ($10.20), which would be something like £3 10s ($12.53) at the consumers' furnaces was an impossible proposition. The Durham quotation was £1 15s ($6.27), ovens, and the one from Yorkshire £1 17s 6d ($6.72).

High freight rates are proving to be a serious handicap. In some instances it has been found that the cost of fuel, plus railway charges, would just about equal the selling price of pig iron. At present there is no sign of such a keen demand for iron as to promise any increase in value. There is a sort of boycott of the coal trade, which the ironmaker means to keep up until he gets reasonable quotations.

The amount of foreign competition in pig iron is attracting attention. A few days ago a contract was arranged for 5000 tons of Belgian pig iron at £5 16s ($20.76), delivered. The material is said to be suitable for foundry purposes. One order is reported to have been taken at £5 10s ($19.69). This is believed to be an isolated case, but plenty of such pig iron can be bought under £6 ($21.48). Belgian producers report they are losing money heavily on this kind of business, but they say they are forced down by ruthless German competition, the rate of exchange being deliberately depreciated for this purpose. The fierce competition between Belgium and Germany, apparently, causes a reflex action on business with this country.

Under the head of wages the Staffordshire ironmaster is getting some relief. The Midland Iron and Steel Wages board has announced a reduction of 80 per cent in ironworkers' wages effective under the sliding scale Aug. 8. The large cut reflects the sweeping reductions in selling prices. The total drop in wages since the beginning of the year is 142½ per cent, and the puddling rate now is 13s 6d ($2.87) per ton, plus 122½ per cent. This is a record reduction in the period and the fact that it has been accepted speaks volumes for the authority of the wages board in times of stress. In the North of England, the ascertainment of selling prices during May and June by the northern board gives the puddlers and other forge and mill workers a reduction of 47½ per cent, making a total reduction since the beginning of the year of 107½ per cent. At present, however, the high cost of materials and railway rates makes production of ordinary bar iron at £16 ($57.28) unprofitable, and Staffordshire mills are idle.

A lot of nut and bolt iron is coming from Belgium under £10 ($35.80) per ton, or about two-thirds the Staffordshire price. From the same country nuts and bolts have been sent at £25 ($89.50) per ton compared with £29 ($103.82), the Staffordshire price. Large quantities of what is called "random" material chiefly consisting of bar or plate ends suitable for stamping or working up are being offered at £7 15s ($27.75), Antwerp. The trade takes full advantage of cheap Belgian steel in the rerolling department. Steel tube skelp can be obtained at about £12 10s ($44.80), several pounds under the British price. The tube manufacturers have bene-

Current Iron and Steel Prices of Europe

British Market

Corrected to Date by Cable

Home Market Prices. Gross Tons at Works or Furnace

SEMIFINISHED STEEL

	$	£ s d
Billets, soft steel	31.11	8 10 0
Sheet bars	31.11	8 10 0
Wire rods	48.50	13 5 0

FINISHED STEEL

Steel bars, England, ½ to 3-inch	45.75	12 10 0
Ship, bridge and tank plates, England	54.90	15 0 0
Ship, bridge and tank plates, Scotland	51.24	14 0 0
Beams, England	49.41	13 10 0
Beams, Scotland	49.41	13 10 0
Sheets, black, 24 gage	62.22	17 0 0
Sheets, galvanized, 24 gage	80.52	22 0 0
Rails, 60-lbs. and over	51.24	14 0 0
Tin plate, base box, 108 lbs	4.58	1 5 0
Steel hoops	54.90	15 0 0

PIG IRON*

Hematite, West Coast, Mixed Numbers	29.28	8 0 0
Hematite, East Coast, Mixed Numbers	29.28	8 0 0
Middlesbrough Basic	21.96	6 0 0
Middlesbrough, No. 3	24.71	6 15 0
No. 3 Foundry, Derby, Leicester, Nottingham	30.20	8 5 0
No. 3 Foundry, Northamptonshire	†	†
No. 3 Foundry, Staffordshire	30.20	8 5 0
No. 3 Scotch Foundry	32.32	8 17 6
Ferromanganese 76 to 80 per cent	65.88	18 0 0

COKE

Yorkshire furnace	5.49	1 10 0
Yorkshire foundry	8.24	2 5 0

*Pig iron quotations are f.o.b. furnace for delivery in the United Kingdom. Export prices generally are subject to free negotiations. †Stocks sold out.

French Market

Prices Last Reported.

PIG IRON

	$	Francs per metric ton (2205 lbs.)
Hematite, Lorraine	32.73	425
Basic bessemer, Lorraine	17.33	225
Foundry, Longwy, No. 3, sand-cast	15.02	195
Foundry, Longwy, No. 3, chill-cast	16.17	210
Foundry, Longwy, No. 2, sand-cast	16.56	215
Foundry, Longwy, No. 2, chill-cast	18.48	240
Ferromanganese, 76 to 80 per cent	73.15	950

COKE

French foundry	8.47	110
German, Belgian and British furnace	8.47	110
French foundry	11.17	145

SEMIFINISHED STEEL

Blooms	23.10 to 24.64	300 to 320
Billets	24.64 to 26.18	320 to 340
Sheet Bars	24.64 to 26.18	320 to 340

FINISHED STEEL

Standard rails	34.65 to 38.50	450 to 500
Merchant bars	27.72 to 29.26	360 to 380
Angles	33.11	430
Normal beams and profiles	38.12	495
Plates, ship and tank, 10 millimeters and thicker	48.13	625
Plates, bridge and tank, 5 to 10 millimeters	53.90	700
Sheets, black, 3 millimeters	56.98	740
Sheets, blue annealed, 2 millimeters	68.53	890
Shafting, cold-drawn, 40 to 60 millimeters	50.05	650
Bars, 2 per cent nickel steel	92.40	1200

All prices are f.o.b. furnace or works.

Belgian Market

Prices Last Reported.

PIG IRON

	$	Francs per metric ton (2205 lbs.)
Basic bessemer, Belgian	12.05	165
Basic open-hearth, Belgian	11.68	175
Gray forge, Belgian	15.70	215
Foundry, No. 3, Belgian	14.60	200
Foundry, No. 3, Luxemburg	10.22 to 10.59	140 to 145
Foundry, No. 3, Lorraine	11.68	160

SEMIFINISHED STEEL

Blooms	19.21 to 19.71	265 to 270
Billets	19.21 to 20.81	265 to 285
Sheet bars	25.19	345
Wire rods	29.20	400

FINISHED MATERIAL

Standard rails	31.03	425
Merchant bars	28.47	390
Normal beams and profiles	27.01	370
Plates, 5 millimeters and thicker	35.04	480
Sheets, black, 3 millimeters	36.50	500
Sheets, galvanized, 1 millimeter	105.85	1450
Plain wire	32.85	450
Galvanized wire	62.05	850
Wire nails	30.66	420

All prices are f.o.b. furnace or works.

fitted by this cheap material, and no doubt retain some foreign business.

There is not much demand yet for finished steel, aside from railway material. A gradual recovery during the autumn is looked for.

South Wales has been somewhat encouraged by the restarting of the tin plate mills of Richard Thomas & Co., Ltd. The mills have capacity of 5000 tons per week. This also brings into operation the steel works, with a weekly production of about 6000 tons. Business in tin plate continues to be restricted. The trade has received some assistance from a reduction of £1 ($3.58) per ton in tin and sheet bars, making the selling rate £9 10s ($34.00). Some business is being done with the Far East, chiefly in oil sizes, and Holland and Scandinavia are placing orders. Prices remain at about £1 7s ($4.84) per box, although on forward account makers will accept £1 3s 6d ($4.21).

A little more life is noted in the galvanized sheet trade, Japan and China having fairly good business to offer. More mills are in operation not only in South Wales but in South Staffordshire. The makers, however, failed to get £24 ($85.92) per ton which they have been seeking, and are selling on the basis of £22 10s ($80.10).

An ominous possibility is the shutting of the shipbuilding yards throughout the country, through the continuance of labor disputes.

French Protest Against High Coke Prices

European Staff Correspondence

PARIS, Aug. 11.—The midsummer calm has spread itself over the entire French metal market. Pig iron is at its lowest possible price under ruling coke conditions and Lorraine plants are protesting continually against having to pay 110 francs ($8.47) for German coke in France, whereas German furnaces are paying the equivalent of 55 francs ($4.23).

Franc—$0.077

Competition in pig iron is making itself more apparent between Belgium, Luxemburg and northeastern France. Hematite from England still is being offered in France at less than the domestic product, the last importation being at 385 francs ($29.64), while the lowest French quotation is 425 francs ($32.72).

M. F. de Wendel, president of the Comite des Forges, has protested in an open letter to the minister of public works against the controlled price of metallurgical coke.

Rolled bars are quoted lower, at an average 360 francs ($27.72) per

metric ton. Competition from beyond the frontiers has brought this about, as manufacturing costs have not been reduced sufficiently to justify it.

Foundries still are paying above 150 francs ($11.55) for their coke and also demand a reduction in the price of foundry iron. Current orders for castings are generally being accepted at about 1500 francs, ($11.50) a ton.

The Comptoir Sidarurgique de France has just announced that it received orders for 50,000 tons of rails in June, which were distributed among its members. This was double the tonnage received in May. Railways are holding off orders as much as possible pending a general reorganization plan which the government is to call for.

Machine manufacturers and engineering shops in general are running on curtailed time though orders are by no means lacking. The high price of machine tools from America by reason of the high value of the dollar, is the reason for increasing activity in the production of woodworking machinery.

Price of Pig Iron Is Reduced in Belgium

European Staff Correspondence

BRUSSELS, Aug. 11.—Important reductions have been made in the prices of Belgian pig iron. This is the result of the trade compact between Belgium and Luxemburg, whereby the importation of iron and steel from that country is favored. The Belgian blast furnace owners have grouped themselves to make a protest, claiming that a death blow will be given the Belgian industry if the agreement is not modified.

Production of pig iron is decreasing. Seven blast furnaces were active in the middle of July and only five at the end of the month.

Franc—$0.073.

Semifinished products from Germany and Luxemburg also are affecting Belgian production and market prices. This competition is being felt here more than it is in France.

The diminution of exports is beginning to make itself felt. The only activities noted are with certain manufacturers of rolling stock who have orders sufficient for three or four months.

The reaction among British buyers since the settlement of the coal strike is considered the chief reason why export business has fallen off so perceptibly. The value of the Belgian franc continues to fall, with relation to the French franc, and certain it is that a lack of foreign business accounts for this fluctuation, which is as good a standard as any other in these times for judging the prosperity of a country.

Japanese Unloading Iron at Low Prices

Special Correspondence

TOKIO, Japan, Aug. 2.—The volume of business in the pig iron market has increased slightly, though general sentiment in the trade has not improved, and prices are weak. One producer is offering material at greatly reduced figures, and quotations as a rule are irregular and unstable.

As a result of low offerings being made by producers in their effort to dispose of stocks, consumers who had remained out of the market for weeks began to take small lots. Interest has grown from day to day until business has become brisk. The visible stocks which nearly reached 400,000 tons will show a heavy decrease.

It is conceded by buyers and sellers that the present movement is but temporary, consumers filling urgent needs while furnaces are offering attractive prices. The "dumping" by furnaces continues, and in this the South Manchurian Railway Co., which operates a large blast furnace in Manchuria takes the lead. According to a market authority the railway company has within a week "dumped" 22,000 tons of iron on the market in Osaka and Kobe, and 2000 tons in Tokio.

No. 1 pig iron has been offered at 48 to 49 yen ($23.04 to $23.48) per ton in Osaka by the railway company. In Tokio, also, the company is offering its iron at similar prices. Sellers in Tokio quote Japanese No. 1 coke pig iron at 68 yen ($32.68); No. 2 at 65 yen ($31.20), and No. 3 at 62 yen ($29.76) per ton. They also quote Hanyang No. 1 (Chinese) at 68 yen ($32.14). Cleveland No. 3 (British) is quoted at 70 yen ($33.60) and Alabama No. 3 at 60 yen ($28.80). Having been alarmed at low-priced offerings from Manchuria the Tokio dealers also are lowering their prices.

Yen—$0.48

Repeated reductions lately by American mills have been felt acutely by the Japanese steel mills, which have shown much indifference on the ground that prices here are below American prices. The disparity, however, is being narrowed every time American reductions are reported. The government steel works which announced a general reduction July 14 did so on account of American reductions. The reductions made by government works range between 20 yen ($9.60) and 25 yen ($12) per ton. The new price for plates and sheets is 120 yen ($57.60) per metric ton. The price for flat and square bars is 130 yen ($62.40) per metric ton. Round bars are 120 yen ($57.60) per metric ton.

Producers' repeated price reductions, the growing tightness of the money market, coupled with the increasing seriousness of shipyard labor troubles, have caused a greater shrinkage in the volume of business in the steel trade. Buying for public works is maintained, but that is insufficient to make good the loss of business in other directions. Shipyard troubles in Osaka have subsided but in Kobe they have grown more serious. Steel and engineering works have become involved. Employers have shut their plants.

Prices accordingly are declining again. Square and flat bars are quoted at 5 yen ($2.40) per 10 kwamme. Ten kwamme is the unit of transactions in Japan, a kwamme is 8.267 pounds. Round bars are 4.50 to 4.80 yen ($2.16 to $2.30) per 10 kwamme. Sheets are 7.50 yen ($3.60) per 10 kwamme and plates 4.50 to 5 yen ($2.16 to $2.40). Nails were kept up to 16 yen ($7.68) per barrel to the close of last week, but this week business is difficult at that price, for European cargoes are being offered at 12 to 12.50 yen ($5.16 to $6.80) for delivery in the months of August and September.

The Japanese government now is enforcing the new law to encourage the steel industry and the shipbuilding industry with subsidies. Material on which the subsidies are paid includes steel billets, steel bars and rods, plates and sheets, and pipes and tubes, exclusive of cast goods. The subsidy on bars and other materials is 15 per cent; on steel billets, 12 per cent. The price, which is the basis of the subsidies, is fixed by the minister of agriculture and commerce on the basis of the price of imported materials at the time of unloading. This is regarded by the government as a good stimulus to the steel industry, but for the present it has little practical value.

German Rolled Steel Products Higher

European Special Correspondence

DÜSSELDORF, Germany, Aug. 11.—German markets have been showing greater activity recently. Prices are considerably firmer. Part of the rise, however, is discounted by the heavy fall in the value of the mark in the past few weeks. As a result of these price changes and political uncertainty with reference to Upper Silesia buyers are now showing a tendency to hold off until the situation has somewhat improved.

Pig iron remains quiet. The syndicate is making efforts to maintain prices for Westphalian hematite and foundry grades although sales continue to be made at less than the so-called official quotations.

Mark—$0.012

Prices of rolled steel are higher. Shapes have gone up to 2100 marks ($26.20) and in some cases even 2300 marks ($28.80) per metric ton. Bars are around 2100 marks ($26.20); standard rails are 2300 to 2400 marks ($28.80 to $30), but mine rails are still obtainable at 1850 marks ($23.10).

Semifinished steel also is stronger, rolled blooms being sold at 1500 to 1600 marks ($18.75 to $20), and billets and slabs at 1530 to 1580 marks ($19.10 to $19.75). Ship plates which have been firm at 1800 marks ($22.50) cannot be obtained today for less than 1900 marks ($23.80). Sheets are 2200 marks ($27.50). Considerable business is being done in pipe.

The ore market for both inland and foreign grades is weak. Transactions are few. Best Bilbao Rubio is quoted at 31 shillings ($5.52) per ton c.i.f. Rotterdam and best washed Santander can be bought for 25 shillings ($4.45) c.i.f. Rotterdam, on a basis of 50 per cent natural in each case.

Canadian Demand for Iron Is Light

Special Correspondence

TORONTO, Ont., Aug. 23.—The consumptive demand for pig iron continues limited to the immediate requirements of users and orders seldom exceed carload lots. No buying is being done for the last quarter and furnaces have only a few orders on their books for the latter part of the current quarter. Foundries throughout Ontario and Quebec have not improved their position recently as far as operations are concerned and the majority of these still are operating only about 10 to 15 per cent of normal capacity. The poor demand now existing for pig iron is blamed on the lack of orders for finished materials and until the demand for foundry products improves there is little chance of any brisk buying movement in the Canadian pig iron market. Production of foundry iron has been at a standstill for some time past and furnace representatives are unable to say when this industry will be resumed. As all furnaces made provision for shutting down months before, large piles of foundry iron are available to meet the demands of melters. The Algoma Steel Corp., Sault Ste. Marie, Ont., has three furnaces and the Dominion Steel Corp., Sydney, N. S., two furnaces producing basic iron for their own consumption, and the Steel Co. of Canada, Hamilton, Ont., is operating one furnace on basic, making a total of six furnaces in operation in Canada at present.

The demand for finished iron and steel has not improved within recent weeks, although, a fair amount of material is moving. Consumers are buying only what they require for immediate needs. Where in normal times mills do not quote prices on small quantities of material, today they are gathering in all the business they can and are quoting on orders for small quantities as well as for those calling for large tonnages. Bars, in some quarters, are said to be improving in demand, but mill representatives say that the demand for this line is still backward, and are still quoting 3.15c per pound Toronto, although it is understood material can be picked up at prices slightly lower. A slight improvement is reported in the demand for light structural shapes, but the heavy class is backward, with mills quoting 3.25c Toronto. Plates are still backward, but an improvement is looked for and inquiries are increasing. Mill prices continue at 3.00c to 3.05c Toronto. Both black and galvanized sheets are falling off in demand and sales along these lines are not quite as heavy as they were a month ago. The demand which has eisted for some time on corrugated sheets has helped to stimulate the Canadian sheet market. Black sheets, No. 28 gage are quoted at 5.40c Toronto, and galvanized at 6.65c.

Srap dealers are buying material only when there is a possibility of reselling it without having to take it into their yards. Heavy melting steel is still being picked up in limited quantities at $8 per gross ton, and turnings at $3 per gross ton, Hamilton. Steel and wrought axles are in very light demand with dealers paying $16 per gross ton Toronto, on both lines. Iron car wheels and heavy axles turnings are still quoted at $18 and $5 per ton Toronto respectively. Foundries continue to buy small quantities of No. 1 machinery cast for which dealers are paying $16 per net ton Toronto. Malleable scrap is in little demand. Dealers picking up what they need at $12 per ton for malleable; $13 for stove plate; $10 for grate bars and $18 for standard car wheels.

Exporters Get Merchant Inquiries

Germany Takes Cuban Rail Order—Merchant Stocks in Orient and South America Believed Depleted—Tenders on State Requirements Suddenly Cease—Japan To Broaden Her Purchases

NEW YORK, Aug. 23.—Reductions in rail rates on export steel and other developments which promise to make for stability in the market at a price level much below that of last year, coupled with a renewed interest on the part of foreign merchants in stock goods is lending considerable confidence to the export trade. This improved optimism was in evidence in nearly every quarter last week and some of the export houses are beginning to declare they have made a mistake in reducing their forces during the slump. Many of the exporters have let go men of technical experience who they now wish they could get back.

Japan has been in the market consistently for thin black sheets and later on, it is promised, she will be asking for rods, wire nails, sheets, tin plate and some rails and track material. Already there are some inquiries for this kind of material. Oriental stocks are said to be small but Germany and Belgium have shipped in supplies on consignment. Germany is making a renewed bid for the foreign business as attested to by many happenings of the past week. For instance, it was learned that Hugo Stinnes has sold cotton ties in the United States. These were sold for a price far below what American mills would quote. While the New York office of Hugo Stinnes reports Germany is not pressing her commodities on this market, it is understood she freely has offered steel articles to New York export houses giving c.i.f. quotations to American customers.

Last week Germany closed an order from Cuba for several hundred tons of rails. These rails are open-hearth and rolled according to American sections. They were sold for $40.50 a ton c.i.f., Cuban ports, including all accessories. The German mill agreed to begin shipment within six weeks and promised that the rails shall meet Hunt's inspection. The buyers were practically forced to accept the favorable terms offered by the Germans.

Nevertheless American export houses are better pleased with the situation because the export market is gradually developing into one where a great volume of the trading will be done in small tonnages and for merchant stocks. This is the business in which the independent exporter excells as it is largely predicated upon business relations and connections. The market is not deluged with public tenders as it has been during the several months past.

For the moment, these merchant inquiries are disclosing the fact the market is not ruled by any set price. Nothing is stable. It is said the Japanese have been buying their thin black sheets at bargain prices in the United States. These sheets have been going at 3.00c, Pittsburgh base, for the 30 and 31 gage, which is about 0.25c below the domestic market. Exporters have been able in most instances to bring out quotations under domestic prices.

Orient Is Most Active

The Orient is the most active market. One exporter has a Japanese inquiry for 800 tons of black sheets. Another exporter has sold Japan an equal tonnage of sheets. Still another sold Japan 1000 tons of sheets. But Japan has not limited her purchases entirely to sheets. During the past week the sale of one locomotive to one of the smaller Japanese railways was reported. Japan has also purchased 900 cases of tin plate, which is equal to approximately 12,000 base boxes. One Japanese agent has purchased recently in the United States 1000 tons of hull plates, 400 tons of bridge material and approximately 1500 tons of steel rails.

The Chinese market also appears to be developing. One exporter has Chinese inquiries for horseshoe iron, wire shorts and scrap, the whole amounting to something like 500 tons. China has also purchased some galvanized sheets.

Chinese railway requirements are apparently the most pressing problems before the market. While it is believed that some considerable portion of this business was going to Europe it is now understood that Americans have a better prospect. Some time ago bids on 41 locomotives and 240 cars for the Peking-Hangkow, the Peking-Cuiyan, and the Peking-Hangchow-Ningpo railways, were opened. On these bids the Belgians submitted some extremely low prices and it was reported the business had been placed with Belgian mills. It now is reported here that Belgium did not get the whole of the order and some of the goods will probably be purchased in other markets.

Cuba and Mexico are the only active markets offered in Central American territory. The Bethlehem Steel Corp. has resumed the movement of iron ore from Cuba. This is a forerunner of some business. At present, Cuba is purchasing cast iron pipe in the United States, but the orders are small. Normal business is yet to develop.

Some anticipations are held for Mexico likewise. The Mexican National railways are drawing back into their employ all the old men who can be found willing to take jobs again. These men were with the Mexican roads before the government took them over. A new purchasing agent has been stationed in New York and the credit has been arranged so that the roads can take 110 locomotives for which negotiations were opened with builders in the United States about two months ago. The Mexican railways have also opened a traffic office in New York and placed E. F. Hoyos at the head of it. Current requirements of the roads will be purchased through the natural channels. An inquiry will go out within a few days for a long list of supplies ranging from boiler tubes to couplers.

South American inquiries indicate an improvement in the markets here. They denote at least the fact that the surplus steel stocks which were so broadly advertised several months ago at last have been practically consumed. One exporter is holding an inquiry from Argentina for 400 tons of iron bars. Argentina also is reported to have requested new tenders for 70 freight cars, broad gage, with a capacity of 40 tons, for use on the port railways at Buenos Aires. The bids will be closed on Sept. 2.

Brazil has submitted inquiries for oval galvanized wire. The bids total a few hundred tons. Colombia has purchased a few hundred tons of tin plate. But the closing of three branches of the National City bank in Colombia, which was announced last week, would seem to indicate that the volume of business with this country may not be expected to be large for some time to come. Another exporter is holding Colombian inquiries for barbed wire, staples, and corrugated galvanized sheets.

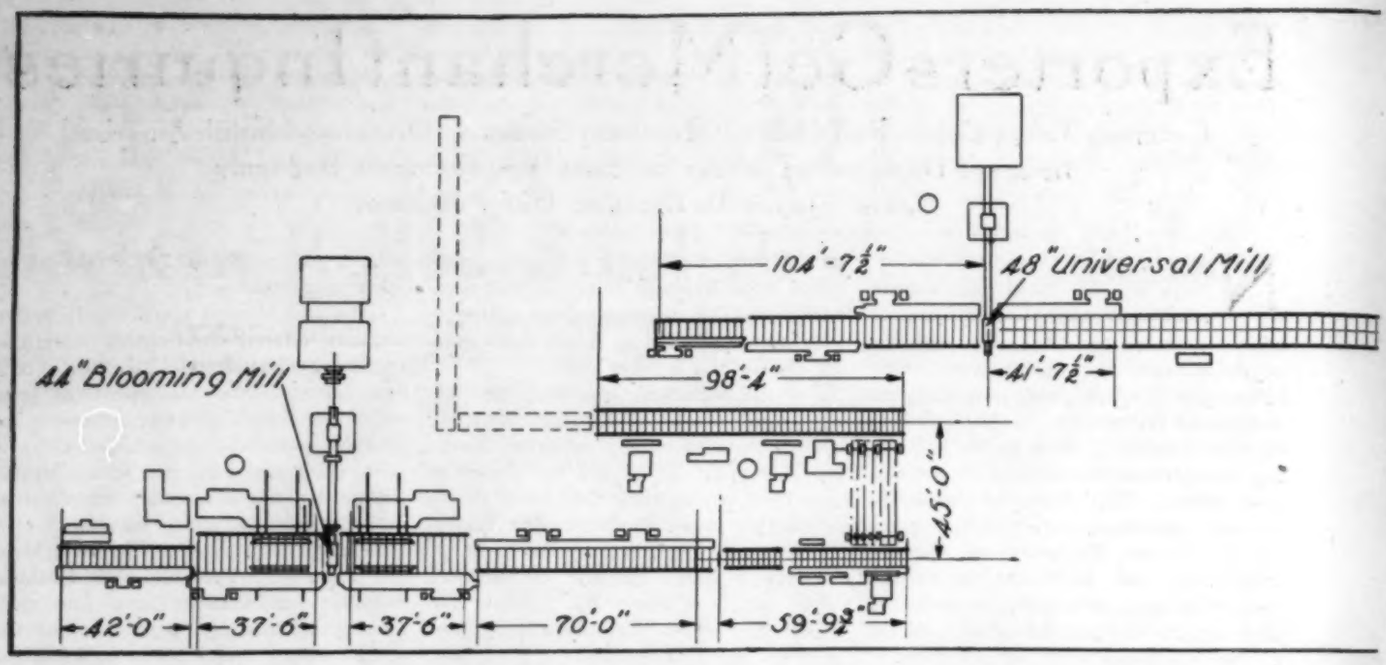


Fig. 1—Layout and General Arrangement of 44-Inch Blooming Mill and 48-Inch Universal Mill Which Will

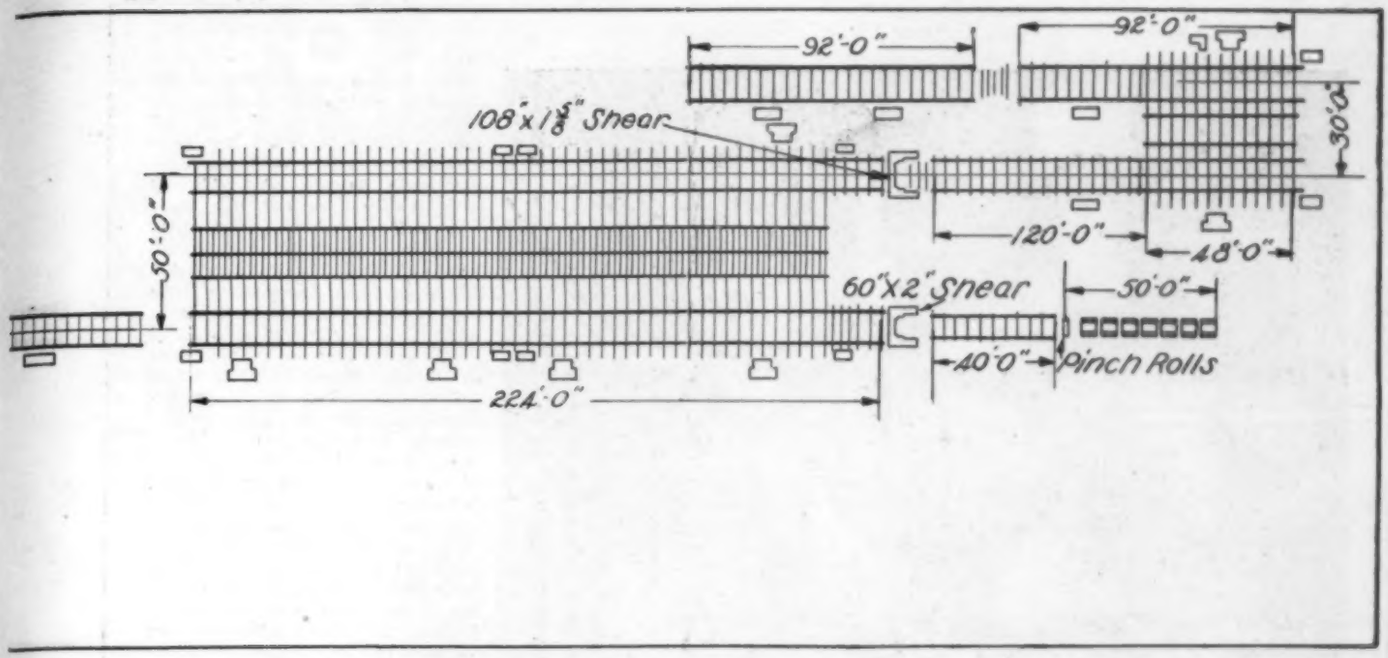
Completes French Rolling Mills

Pittsburgh Company Builds 44-Inch Reversing Blooming Mill, 48-Inch Universal Plate Mill and Auxiliary Machinery To Be Installed in Plant at Homecourt— General Description and Layout of the Equipment

DURING 1919, a delegation of French engineers representing the Cie des Forges & Acieries de la Marine & d' Homecourt and the Societe Anonyme des Acieries de Micheville visited the United States to study American rolling mill practice. Their visit resulted in the placing of a large contract with the United Engineering & Foundry Co., of Pittsburgh, consisting of one 44-inch, two-high reversing blooming mill and one two-high reversing 48-inch universal mill for their Homecourt plant; one 44-inch and one 36-inch two-high reversing blooming mill, one 28-inch combination rail and structural mill consisting of three stands and one 24-inch and 20-inch cross country light structural mill consisting of five stands for their Micheville plant. The contract included rolls and guides, all tables, manipulating devices, shears, cooling beds and auxiliary machinery necessary for complete handling of the product to be rolled. This is said to be the largest contract for rolling mill machinery ever placed in America by foreign interests.

All rolling mill equipment for the Homecourt plant has been shipped and the accompanying illustrations and sketches show the arrangement and characteristics of the mills. The Homecourt plant will be devoted principally to small billets and sheared and universal plates. The 44-inch blooming mill will, therefore, roll blooms for the continuous billet mill and slabs for the plate mills. Fig. 1 shows the general arrangement of the blooming mill to the 48-inch universal mill. The continuous mill will be located in tandem to the blooming mill and adjacent to the universal mill. The

FIG. 2—INTENSIFIER WHICH IS PLACED BETWEEN THE HYDRAULIC SHEAR AND THE REVERSING DIRECT-CURRENT MOTOR DRIVE. THE MOTOR, LOCATED ON THE OTHER SIDE OF THE BRICK WALL, IS CONNECTED TO THE INTENSIFIER BY A RACK AND PINION



Be Installed in the Homecourt Works of the Cie des Forges & Acleries de la Marine & d'Homecourt, France

sheared plate mills will be located adjacent to the universal mill so that one stock yard will serve all mills.

The blooming mill is of the well-known two-high reversing type. The pinions are 44-inch pitch diameter and the rolls about 37 x 100 inches. The roll housings are of the A—frame type, made of cast steel weighing about 115,000 pounds. The maximum lift of the top roll is 52 inches. The manipulator is of the Wellman-Kennedy type, equipped with Leck side guards. The mill and approach tables are built with all gears enclosed in oil and dust proof cases. All the bearings are lubricated with oil from a central oil system. The table rollers are steel castings with integral forged journals. The approach table is provided with a special ingot tilter so that either the top or the bottom of the ingot can be entered into the mill. The maximum slab which can be rolled on the mill will be about 48 inches wide. The weight of ingot rolled will usually be about 10 tons.

For cutting the blooms and slabs an electrohydraulic shear is used. This will be the second installation of its kind. In the electrohydraulic shear, advantages of a steam hydraulic shear are obtained. In addition the transmission of electric alternating current is easily accomplished and economical. The layout of the shear is shown in Fig. 1. The shear, which is shown in Fig. 3, is of the down-cut single cylinder type. The main cylinder is connected by means of forged steel pipe to the intensifier. The ram of the intensifier is moved by a reversing direct current motor operating through a pinion and rack. This motor receives its power from a flywheel motor generator set similar to those used for driving reversing blooming mills. The reversing motor capacity is 700 horsepower at 86 revolutions per minute. The induction motor capacity of the motor generator set is 450 horsepower, alternating current, 3 phase, 6600 volts.

The shear has a maximum opening of 24 inches and a maximum power stroke of about 14 inches. When

FIG. 3—SIDE VIEW OF THE ELECTROHYDRAULIC SHEAR FOR CUTTING BLOOMS AND SLABS. IT HAS A MAXIMUM OPENING OF 24 INCHES AND A MAXIMUM POWER STROKE OF 14 INCHES. FOR CUTTING MATERIAL OVER 12 INCHES THICK, TWO STROKES OF THE INTENSIFIER ARE REQUIRED

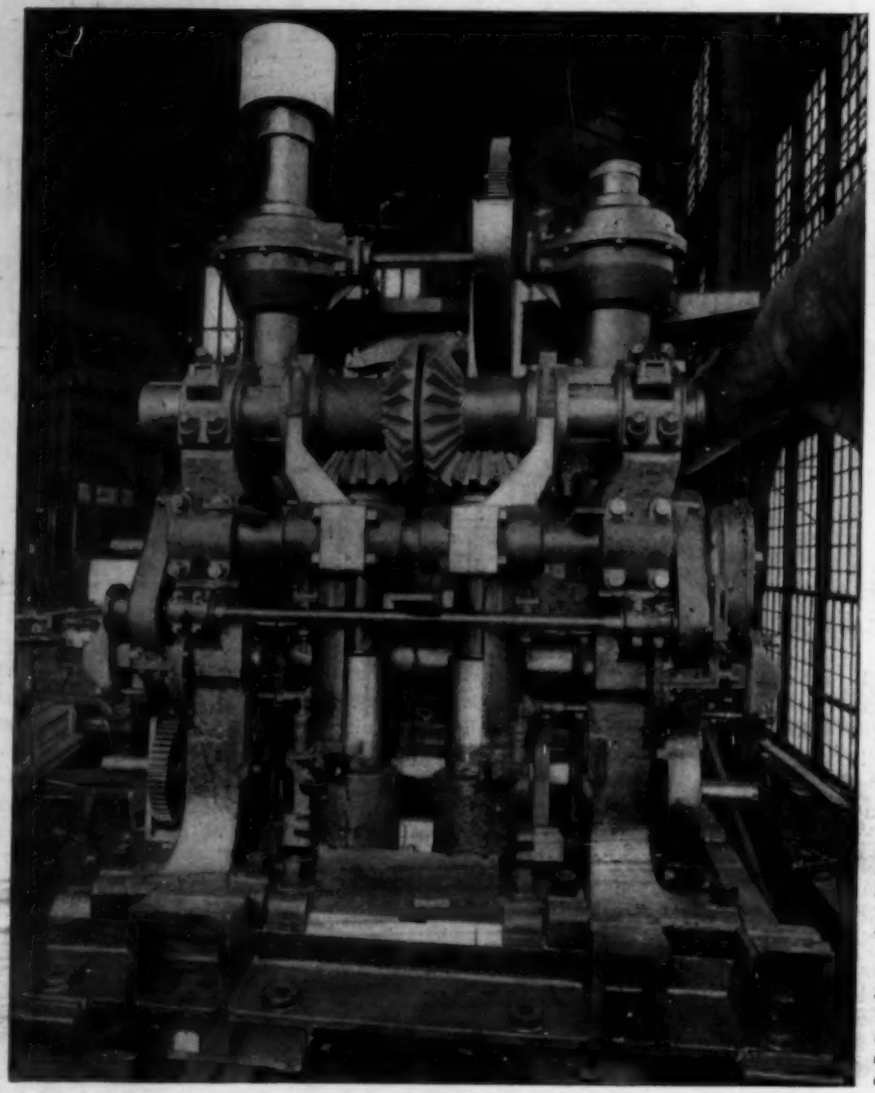


FIG. 4—FRONT VIEW OF 48-INCH UNIVERSAL PLATE MILL SHOWING ROLLS AND DRIVE

Fig. 4 is a front view of the universal plate mill showing the general arrangement of rolls and drive. The mill is of the two-high reversing type with four vertical rolls, two on each side. It is in reality a combination slabbing mill—a universal plate mill, and a two-high sheared plate mill. The top roll has a maximum lift of 24 feet. The vertical rolls have a range from 11 to 48 inches wide. The horizontal rolls are 34 x 100 inches and the vertical rolls 20 inches diameter. The main bevel gear shaft is 15 inches diameter with the keys forged integral with the shafts. Bevel gears mounted on the shaft are 46 inches pitch diameter, 23 teeth, 6.28 inches circular pitch, 12-inch face and have a bearing on the shaft of 45 inches long. The bevel gears keyed to the vertical rolls have 16 teeth. Rapid changing of rolls was given special attention. The horizontal rolls are changed through the housing window.

Fig. 5 shows a top view of the mill. The two motors operating the screwdown are mounted on a removable motor base. By loosening several keys and making one hitch with the crane, the top of the mill is cleared. The motors for operating the screws for the vertical rolls are detached from the mill and located between the pinion and roll stands. Pinions for driving the vertical rolls were made small in diameter to reduce the amount of inertia to be overcome in reversing. The pitch diameter of the main pinions are 36 inches and those for the vertical rolls are 34 inches. The three pinions for the vertical rolls are mounted in a separate cap, and can be removed as a unit when it is necessary to substitute a standard cap in case the mill is operated as a two-high blooming mill or sheared plate mill.

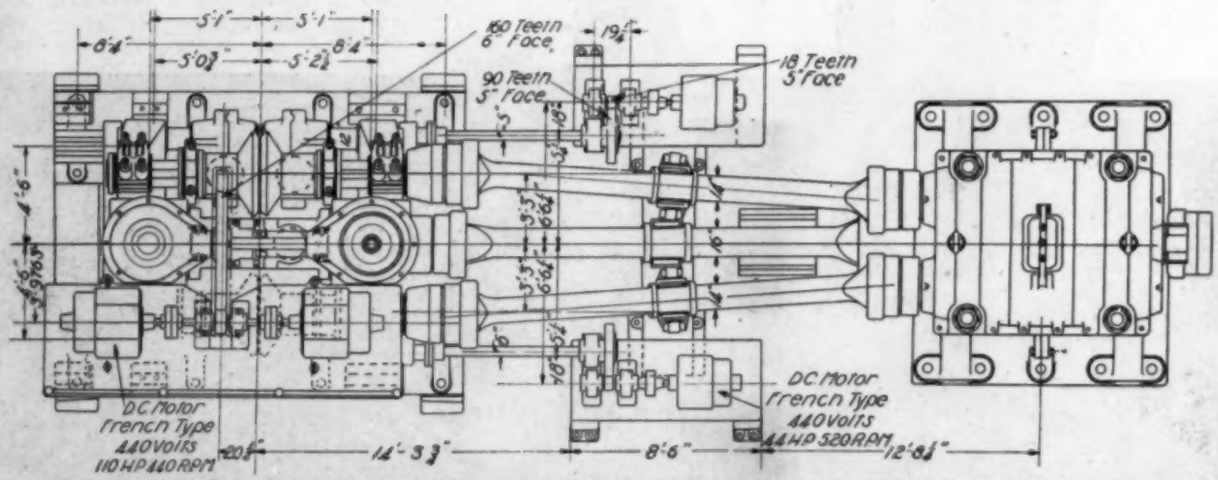


FIG. 5—A TOP VIEW OF THE MILL WHICH SHOWS THE LOCATION OF SCREWDOWN MOTORS AND ROLL DRIVING PINIONS

blooms or slabs thicker than about 12 inches are to be cut, it is necessary to make two strokes of the intensifier. The top shear knife follows the operating lever, in length of stroke, speed of cutting, and direction up or down. This is accomplished by means of a floating lever control regulating the speed and direction of the rotation of the reversing motor. The top knife head is counter-balanced by an accumulator working on a closed hydraulic system, so that the movement of the accumulator corresponds with the movement of the top knife but in opposite direction. The main system is also a closed system, the water moving from the cylinder to the intensifier and vice versa, as the shear is operated.

Three Cuts Per Minute

To supply any leakage that may occur and also to provide for double stroking, a prefiller tank is connected to the main pipe line. The water in this tank is under air pressure varying from 60 to 80 pounds depending upon the amount of water in the tank. Fig. 2 shows the intensifier. The pinion and rack cannot be seen as they are covered with a shield; the motor is located up on the otner side of brick wall. The first installation was made at the plant of the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., and the illustrations were taken at that plant. The capacity of the shear is 1250 tons and will cut a maximum slab 12 x 48 inches in cross section. It will cut these at the rate of three cuts per minute. Smaller blooms and billets will be cut at a correspondingly faster rate depending approximately upon their cross sectional area and stroke required.

Plate Mill Is of Usual Type

The 48-inch universal plate mill layout is shown in Fig. 1. The furnaces are not indicated but it will be served by one continuous unit and from 4 to 5 side door heating furnaces. The layout is of the usual plan consisting of mill with tables, a hot leveler, a chain cooling bed equipped with a series of clamps for straightening universal plate edgewise and shears for cutting the product to length. At the finishing end there also will be a leveler for straightening plates cold. The layout and the machinery is designed so that sheared plate can be rolled and handled. A piler is provided, at end of cooling bed entering table, to accommodate skelp or heavy flats which can be piled hot without side straightening. While the layout is of the usual type, the mill itself deviates from former designs. Fig. 4 shows front view of mill and general arrangement of rolls and drive. The mill is of the two-high reversing type with 4 vertical rolls, two on each side. It is in reality a combination slabbing mill—a universal plate mill—and a two-high sheared plate mill. The top roll has a maximum lift of 24 feet. The vertical rolls have a range from 11 inches to 48 inches wide. The horizontal rolls are 34 inches x 100 inches and the vertical rolls 20 inches diameter. Heretofore the bevel gears driving the vertical rolls of universal mills were designed too small while the vertical rolls with their gears and driving shafts were hard to dismantle, making roll changing awkward and expensive. These details in design were considered in this mill without sacrificing minimum width of the finished product.

The main bevel gear shaft is 15 inches diameter with the keys forged integral with the shafts. The bevel gears mounted on the shaft are 46 inches pitch diameter, 23 teeth, 6.28 inches circular pitch, 12 inch face and have a bearing on the shaft of 45 inches long. The bevel gears keyed to the vertical rolls have 16 teeth. Rapid changing of rolls was given special attention. The horizontal rolls are changed through the housing window. To change the vertical rolls the first procedure is to remove the caps and then lift out the bevel gear shafts. The caps securing the vertical roll housing top guide shaft next is removed, and both vertical rolls, housings, bearings, etc., are lifted out as a unit.

Spare vertical roll housings are furnished with the mill so that vertical rolls can be fitted up ready to drop into place. When used as a sheared plate mill, the vertical rolls are removed and a feed roller dropped into place filling up the gap between the mill table and the horizontal rolls. The distance from the vertical rolls to the horizontal rolls is 33 inches, hence the minimum length of slab or ingot will be about 30 inches. Fig. 5 shows a top view of the mill. The two motors operating the screwdown are mounted on a removable motor base. By loosening several keys and making one hitch with crane, the top of mill is cleared. The motors for operating the screws for the vertical rolls are detached from the mill and located between the pinion and roll stands.

Reversing Detail Is Considered

The spindles are fitted with universal couplings designed by the United Engineering and Foundry Co. The pinion housing is bolted directly to the foundation. Pinions for driving vertical rolls were made small in diameter, to reduce the amount of inertia to be overcome in reversing. The pitch diameter of the main pinions are 36 inches and those for the vertical rolls are 34 inches. The three pinions for the vertical rolls are mounted in a separate cap, and can be removed as a unit when it is necessary to substitute a standard cap in case the mill is operated as a two-high blooming mill or sheared plate mill. All bearings on the pinion housings are connected to the oil system.

The product of the mill will be universal plate from 11 to 48 inches wide and 12 gage to 2 inches thick and sheared plate 84 inches wide.

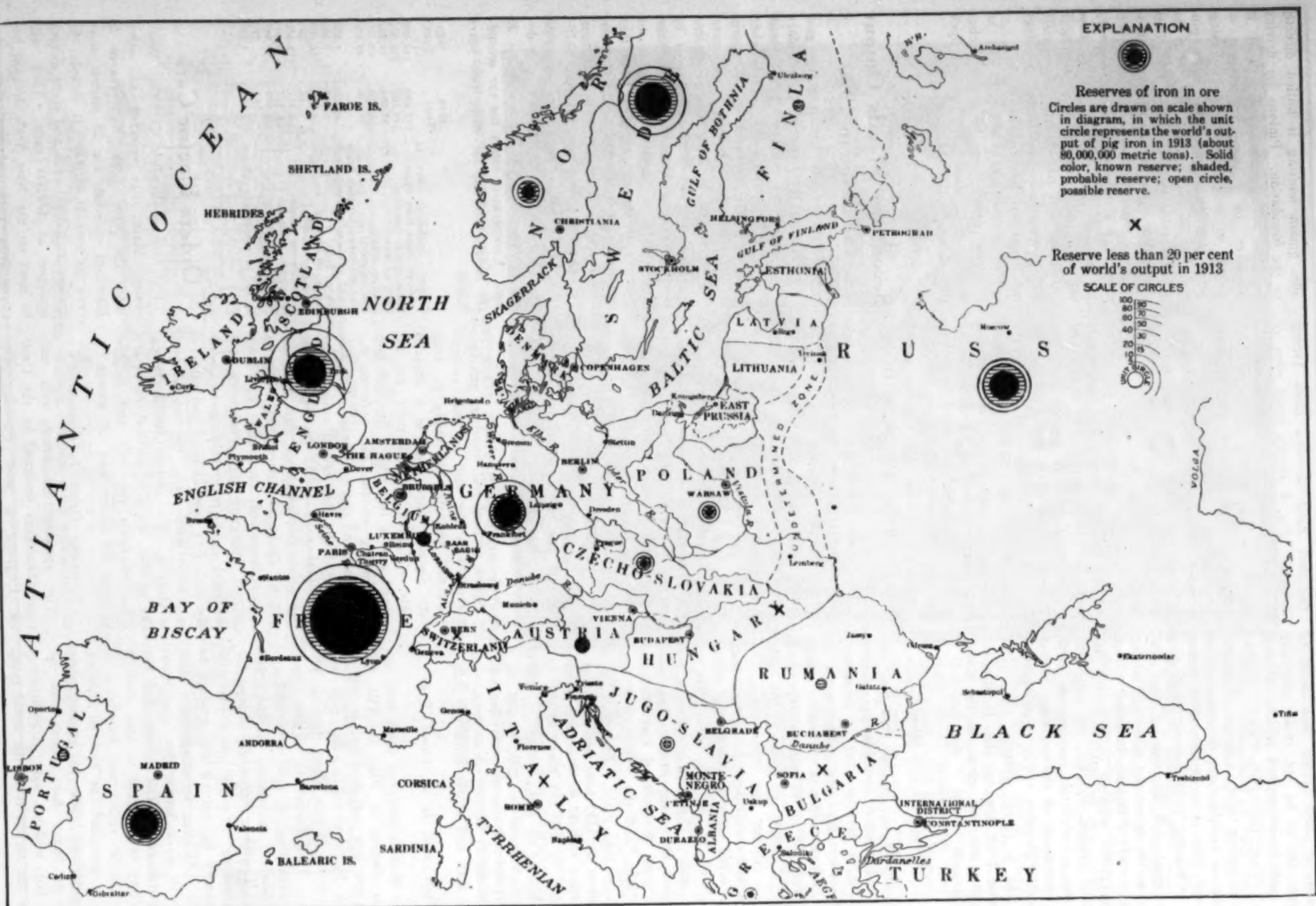
Secondary Metals Output Increased in 1920

According to the United States geological survey the recovery of secondary metals including copper, brass, lead, zinc, tin, antimony, and nickel when used as metals increased in 1920 over 1919. Aluminum showed a decrease. Zinc recovered by distillation amounted to 21,371 tons while that recovered by remelt, sweating etc., was 21,479 tons. Clean tin plate scrap treated for the recovery of tin and including 6436 tons imported totaled 154,804 tons. Old tin-coated containers treated were 1725 tons. Tin metal imported in 1920 was 62,795 tons and tin concentrates imported were 34,325 tons. Tin derived from domestic ores in 1920 amounted to 20 tons. Comparative totals for the secondary metals received for these two years follow:

	1919 Tons	1920 Tons
Copper, including that in alloys other than brass	112,400	130,600
Brass scrap remelted	249,700	259,800
Lead as metal	55,684	56,350
Lead in alloys	66,416	68,300
Zinc as metal	39,910	42,850
Zinc in alloys other than brass and in chemical compounds	6,062	7,650
Tin as metal	5,977	7,200
Tin in alloys	18,056	16,300
Antimony as metal	48	200
Antimony in alloys	4,351	5,400
Aluminum as metal	6,017	5,000
Aluminum in alloys	12,674	10,500
Nickel as metal	163	270
Nickel in nonferrous alloys	2,284	1,930

Orders Electric Cars

The Osgood Bradley Car Co., Worcester, Mass., has received an order from the New York, New Haven & Hartford railroad, for 22 electric zone cars, to cost $1,400,000. It includes 14 trailers at $35,000 each and eight motors equipped at $70,000 each. They will be used on the New York division between New York and New Haven.



RESERVES OF IRON IN ORE IN EUROPE, APPORTIONED AMONG THE COUNTRIES AND SHOWN ON PROPORTIONAL SCALE

Europe's Iron Reserves Defined

Peace Commission's Statistics Give Total Tonnage of Metal Contained in Ore Deposits as 12,405,000,000 Metric Tons—Germany in Fourth Rank—Present Position of Leading Nations Determined

BY MAX ROESLER

THE world's iron ore resources are not sufficiently explored to permit an exact comparison of the resources of the several continents, but an approximate comparison may be allowable. The reserves of North America are well known but have never been calculated to the same exactness nor to the same lower limit of grade as those of Europe. If so estimated they could probably be counted on for three times as much iron as those of Europe.

The resources of South America are not so well known. Extensive deposits of deep-seated origin lie along the western slopes of the Andes, and immense pre-Cambrian reserves are found in Minas Geraes and Urucu in Brazil. The ore in Minas Geraes district that contains over 45 per cent iron, is estimated to carry more iron than that in all Europe, and the inclusion of ores of lower grade would greatly increase the estimate. If its reserves are estimated as closely as those of Europe have been South America would undoubtedly prove to have at least twice as much iron as Europe.

The information concerning Africa is indefinite. Except the writers of some French and German reports on the iron ore deposits of northern Africa, the men reporting on the deposits of that continent have regarded them as abstract geologic phenomena, whose economic value was of no interest. It is this lack of records of practical value that has compelled the writer to estimate the iron ores of Africa at about one-sixth of those of Europe.

World's Reserves Summarized

The iron ore reserves of Asia are not well known. Mines are working in China and Chosen. India has considerable reserves and a small industry, and Siberia has extensive reserves. Large deposits of laterites are found in the Philippines. Probably Asia can be counted on for at least three-fourths as much iron as Europe.

A summary of the iron ore reserves of the world, in which those of Europe are reckoned as unity, shows the following comparative figures, which, however, because of a lack of complete knowledge are admittedly not precise:

Europe	1
North America	3
South America	2
Africa	1/6
Asia	¾

These figures indicate that the world's available supply of iron would last more than 1000 years at the rate of production of 1913. On the other hand, if production continues to increase at the prewar rate, which was 25 per cent in every five years, the supply would be exhausted in about 130 years. Use at this rate would involve the consumption of 6,000,000,000 tons of pig iron in the year 2043, as compared with about 80,000,000 in 1913. A growth of industry so great as this output would imply does not seem to be probable. A considerable reduction in the rate of increase in production and a correspondingly longer life of the world's iron ore reserves seem far more likely.

France has the largest reserves in Europe. She stands so clearly above the other countries that there is no question of her holding first place.

England Ahead of Sweden

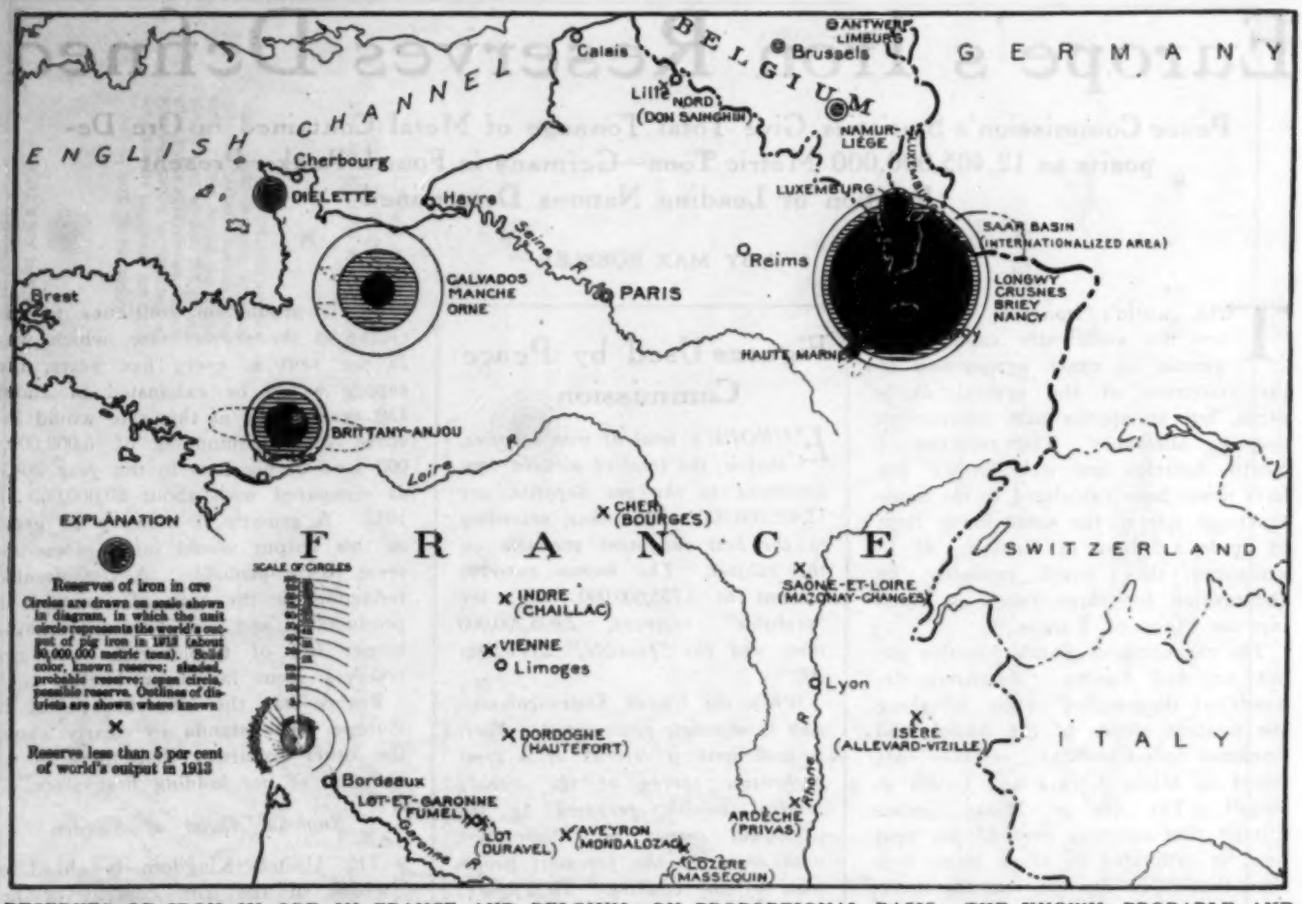
The United Kingdom is ahead of Sweden in the iron content of her total reserves. Good information is available in regard to the iron ore deposits of both countries. The Swedish reserve is preponderantly magnetite of high grade; the British reserve is carbonate and hematite of much lower grade. The "known" and "probable" ore can be estimated for both countries with considerable assurance as to the accuracy of the figures. The estimation of the "possible" reserves involves decision on matters that are open to controversy and must depend on the attitude of the person making the estimate. The quantity of ore in Sweden that can be put in this class depends on the depth to which mining can be carried in ores that, under normal conditions, are bound to have a ready market. The estimate for Great Britain is complicated by the fact that much of the ore there can not compete with foreign ores, even if it may be readily minable, so that in spite of the erroneous British reserves the use of imported ores in England is increasing and the production of domestic ores is decreasing. The enormous reserves of iron that English geologists have estimated as in the ground in Great Britain are undoubtedly there, but they will probably not be used in a quantity greater than that shown by the figure given under "possible" reserves, and even that figure may eventually prove to be too large.

Figures Used by Peace Commission

EUROPE'S total of iron reserves, that is, the total of metallic iron contained in the ore deposits, are 12,405,000,000 metric tons, according to the best judgment available on the subject. The known reserves amount to 3,735,600,000 tons; the "probable" reserves, 2,898,200,000 tons, and the "possible," 5,771,200,000.

When the United States commission to negotiate peace went to Paris it took with it records of a comprehensive survey of the world's mineral wealth, prepared by the geological survey in collaboration with some of the foremost geologists of the country. The figures and exhibits contained in the accompanying article were part of those records; not originally intended for publication but recently released by the geological survey as of general interest. The feature of this report is that all statistics have been reduced to a common basis, namely, the iron contained in the ore. The basis for figuring "known," "probable" and "possible" reserves also is defined.

The author who wrote an extensive report on the subject, of which the accompanying article is an abstract, disclaims any original research. In his words: "It is simply the result of a study of the work of many writers and is an attempt to reduce the variant products of that work to common values." The abstract is introduced with the author's general observations with respect to Europe, in comparison with the world's deposits.



RESERVES OF IRON IN ORE IN FRANCE AND BELGIUM, ON PROPORTIONAL BASIS. THE KNOWN, PROBABLE AND POSSIBLE RESERVES IN NORMANDY, WHICH INCLUDES CALVADOS, MANCHE, ORNE AND DIELETTE, TOTAL 1,355,000,000 TONS, AS COMPARED WITH THE KNOWN RESERVES OF 1,548,000,000 TONS IN LORRAINE

The fourth rank should go to Germany. The estimates of her ore reserves have been carefully worked out and are acceptable for "known" and "probable" ore. The accuracy of the large figure for the "possible" reserve, 911,700,000 tons, shown in the accompanying comparative table, depends on the future of the Salzgitter-Iselde and Wurtemburg-Bavarian fields. Production in both these districts was steadily increasing before 1914. Germany has shown her capacity to use her resources thoroughly enough to justify the conclusion that she will continue to use them in spite of the native pessimists who can foresee her future as only that of an agrarian state.

Spain Fifth on List

Spain stands fifth. Her measured and available reserve is next to that of Sweden, but difficulties and expenses of transportation, which have been left out of consideration in calculating her reserve, make it questionable whether her entire reserve will be mined.

Central Russia is sixth in quantity of iron ore. The present outlook is that political conditions will delay the normal development of this field.

Norway has a large quantity of concentrating ore that has not been so useful in the past as it may be in the future.

Southern Russia, in its ore in Krivoi Rog and Kerch, has a valuable reserve, and future development may give her a higher place than the eighth, her present rank.

Czecho-Slovakia, the Ural mountain region, the Austrian republic, and Luxemburg have nearly equal amounts of known ore, and Poland has a reserve of unknown value. All these may be put in the same class so far as reserves of iron ore are concerned. The principal reserves in Czecho-Slovakia are the oolitic silicate and brown ores of Central Bohemia and the spathic ores of the Szepes-Gomor district. The possession of these reserves and of those in that part of the Dombrova coal basin that lies in former Austrian Silesia places Czecho-Slovakia in a strong position to establish and maintain an iron industry.

The Austrian republic has an excellent reserve in the spathic ores of Styria and Carintha, but its utilization is more or less dependent on foreign coal.

The Luxemburg part of the minette basin constitutes a fully explored and valuable reserve, but it is a problem how completely it will be exhausted. Only about a third of the reserve has been assigned to the "probable" class.

The reserves of Poland are composed largely of brown ores that in a critical scheme of classification lie close to the line that separates available from unavailable ores. Slight changes in technology may increase their value; or a slight decrease in the cost of competing ores may make them valueless.

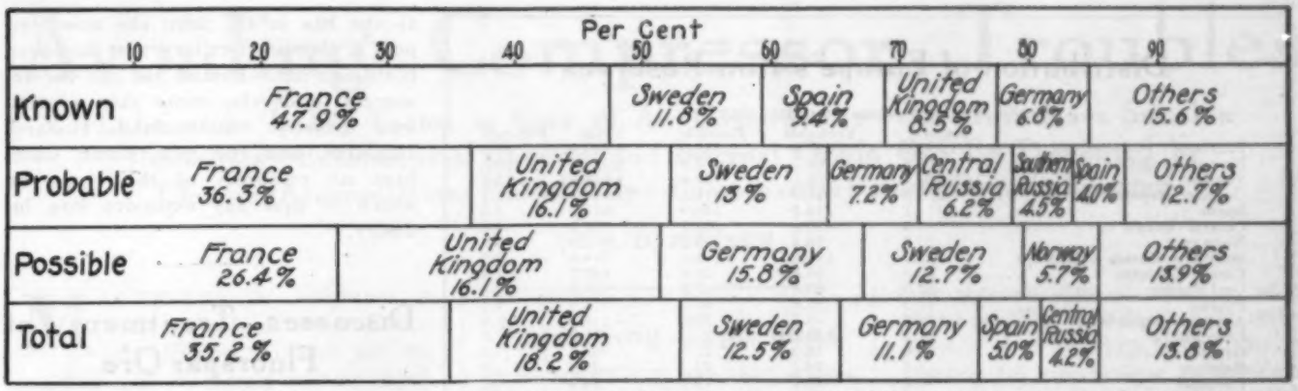
The chromiferous ores of Greece will be a desirable addition to the European supply of iron ore for some time to come. Belgium, Portugal, Jugo-Slavia, the Caucasus, Finland, Rumania, Italy, Switzerland, and Bulgaria all have small reserves. Turkey in Europe contains some ore; Holland, Denmark, and the Baltic states contain practically none.

How Reserves Are Classified

The accompanying table shows in quantities and percentages the geographic distribution of the iron in the ore deposits of Europe, under the following three general classifications, "known", "probable" and "possible":

"Known" ore is developed material that is or can be profitably mined now.

"Probable" ore is material that may probably be mined hereafter, the prob-



ESTIMATED PROPORTIONS OF EUROPE'S IRON INVENTORIES CONTAINED IN THE ORE DEPOSITS OF THE VARIOUS COUNTRIES

ability being based on present standards in mining and metallurgy and on geologic indications as to the continuity of the deposit.

"Possible" ore includes ore of present commercial grade which lies so deep that it is not now available but which a slight improvement in mining methods or an increase in price would render available; ore which is of lower grade than that now used but so near to that of present grade that it will probably be used in the not distant future; ore which is used chiefly as flux, and ore which is chemically not fit for use in present metallurgical practice but that may be used in the future, such as titaniferous ore or ore containing a large quantity of silica. The figures showing "possible" ore must be used with caution, because even though they are the result of careful consideration they involve many assumptions and are subject to many errors in judgment. They have comparative value as all have been evaluated with equal rating.

France and Germany

After considering all the factors enumerated and studying all information available the following estimates were adopted as representing present iron reserves in the Lorraine basin:

(Millions of metric tons)

France:	Known iron	Probable iron	Possible iron
Former German Lorraine..	558	150	150
French Lorraine.....	990	225	300
	1,548	375	450
Luxemburg	60	21	..
	1,608	396	450

France's total of iron reserves is now estimated as follows:

(Millions of metric tons of iron)

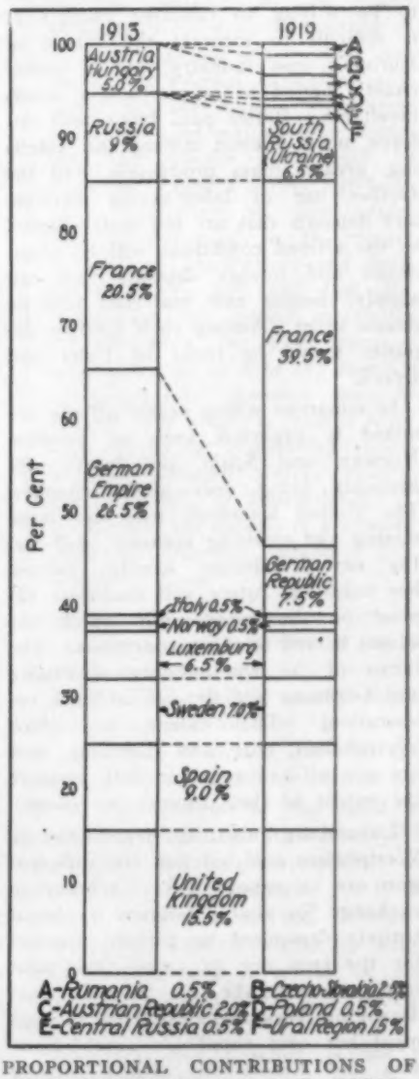
	Known	Probable	Possible
Lorraine	1,548.0	375.0	450.0
Normandy	105.0	425.0	825.0
Britany and Anjou...	115.0	230.0	230.0
Pyrenees-Orientales ..	16.5	16.5	16.5
Haute-Marne	5.5	...	4.5
Other deposits	..	7.1	..
	1,790.0	1,053.6	1,526.0

Germany's iron resources are summarized by districts as follows:

(Millions of metric tons of iron)

	Known	Probable	Possible
West Rhine.....	1.3	2.0	0.2
East Rhine	118.9	58.0	65.1
Weser	98.9	38.5	434.7
Bog ores (north and central Germany)..	2.4	2.4	2.4
Thuringia	15.9	13.5	27.3
Wurtemberg and Bavaria	17.9	92.0	382.0
Schmiedeberg	.3	1.0	..
	255.6	207.4	911.7

The indicated capacity of the German republic to produce iron ore is only 20.5 per cent of the capacity of the former German Customs Union, whereas its indicated capacity of consumption is 56.4 per cent of the capacity of the former German Customs Union. Thus, to continue the iron and steel industry of the territory now remaining at the same rate as before the war, Germany must import a much larger proportion of the ore required than in the past. If artificial barriers are erected against this importation the iron industry of Germany will decline and ultimate consumers in other countries will lose a source of cheap iron and steel. Germany's reserves of ore still appear to be fairly extensive, but she has no iron-ore producing districts that rank with those that have been lost.



PROPORTIONAL CONTRIBUTIONS OF THE COUNTRIES TO THE TOTAL QUANTITY OF IRON ORE PRODUCED IN EUROPE IN 1913, AND PROPORTIONS OF POTENTIAL OUTPUT UNDER THE NEW POLITICAL SUBDIVISIONS OF 1919

Output Per Man Compared

The iron industry in Europe labors under several disadvantages as compared with the industry in the United States. Perhaps the greatest of these disadvantages is the low output of iron per man employed in mining ore. The following table gives some figures for comparison:

	Tons
Sweden	395
Lorraine Annexee.....	378
French Lorraine	375
Luxemburg	355
France outside of Lorraine.....	300
Germany outside of Lorraine Annexee..	92
United Kingdom	230
Spain	140
United States	590

The figures representing the annual output per man in the other important branch of the iron industry, coal mining, show a similar difference between the product of labor in Europe and in the United States.

A further disadvantage in Europe appears to be the comparatively low blast furnace output. In the United States the tendency to develop or improve the unit and to decrease the number of units employed has resulted in an annual output of 120,000 tons per blast furnace. In Europe, where the tendency is to keep old equipment in service as long as possible without improvement, the annual output per furnace is much less. In Germany it is 55,500 tons and in England it is 28,000 tons.

If greater output per unit is a measure of efficiency Europe falls far be-

Distribution of Europe's Iron Reserves

Metallic iron in millions of metric tons

	Known	Probable	Possible	Total	Per cent
France	1,790.0	1,053.6	1,526.0	4,369.6	35.2
United Kingdom	317.5	464.3	1,472.3	2,254.1	18.2
Sweden	442.9	376.1	720.6	1,548.6	12.5
German Republic	255.6	207.4	911.7	1,374.7	11.1
Spain	353.1	116.3	148.9	618.3	5.0
Central Russia	140.0	180.0	204.1	524.1	4.2
Norway	85.8	56.4	330.1	472.3	3.8
Southern Russia (Ukraine)	71.0	131.0	142.0	344.0	2.8
Czecho-Slovakia	32.3	84.8	58.6	165.7	1.3
Ural region	52.3	60.8	47.8	160.9	1.3
Poland	11.2	50.6	69.2	131.0	1.1
Austrian Republic	76.7	9.5	30.0	116.2	.9
Luxemburg	60.0	21.0	...	81.0	.7
Greece	18.0	18.0	22.5	58.5	.5
Belgium	2.5	14.1	23.2	39.8	.3
Portugal	6.2	16.2	12.5	36.9	.3
Jugo-Slavia	9.5	8.0	16.0	33.5	
Caucasus	6.2	6.2	18.6	31.0	
Finland	3.6	11.4	1.9	16.9	
Rumania	2.5	8.5	4.0	15.0	.8
Italy	5.5	3.3	..	8.8	
Switzerland	1.2	..	2.2	3.4	
Bulgaria	..	.7	..	.7	
	3,735.6	2,898.2	5,771.2	12,405.0	100.0

low the United States in the three elements of output in the iron industry, iron in ore mined per man, coal mined per man and pig iron produced per furnace; but as Europe has heretofore been able to compete with the United States in cost of product she must have had some counterbalancing means of economy in production. One of these may have been cheaper transportation. In the United States the great ore producing center is the Lake Superior district, and the great coal producing center of the Appalachians is on an average 725 miles away from the iron and is 125 miles from tidewater. In England coal and iron are close together and are so near tidewater that they can be cheaply shipped for export. On the continent the Lorraine basin is separated from the Westphalian coal field by only 200 miles, and the coal field is connected with tidewater by an excellent canal and river system.

Cheap Labor Abundant

Another means of economy in production in Europe has been an abundant supply of cheap labor, which has enabled the European producers to turn out cheap products from comparatively poor natural material without employing labor-saving devices to the extent that they have been employed in the United States. This advantage, however, has had the evil effect of producing a surplus of finished products for the domestic market. Cheap labor, more or less discontented, can not supply the ultimate market supplied by high-priced labor, with its higher standard of "necessities." The fact that the domestic markets in Europe could not take their proper share of the finished products no doubt added to the need for foreign markets, and that need had a share in precipitating the war. Europe's supply of labor is bound to be great, but it does not now seem to be willing to continue cheap. It is difficult to forecast the future of Europe's iron industry, but a rather chaotic period of reconstruction seems inevitable. Better paid labor will enforce more efficient mining and smelting, greater mass production, and the further use of labor-saving devices; and deposits that are not well adapted to the altered conditions will be abandoned and foreign deposits that can supply cheaper raw materials will be drawn upon. Among such foreign deposits would be those of Cuba and Brazil.

In countries where nearly all the ore mined is exported, such as Sweden, Norway, and Spain, the future will probably bring only slight changes. The United Kingdom, with her large mining and smelting industry, will feel the new conditions keenly; indeed, her industrial future will doubtless depend on the speed with which she adapts herself to those conditions. The future of the iron industry of France and Germany will depend on their cooperation. The extent to which Westphalian coal and Lorraine iron ore are utilized together will measure the extent of their success or failure.

Luxemburg also is dependent on Westphalian coal but has not sufficient iron ore to export it to Germany in exchange for coal. Belgium is almost entirely dependent on foreign deposits for the iron ore to supply her blast furnaces, and she has in the past drawn on Westphalia for coal to augment her own supplies. Czecho-Slovakia and Russia are almost entirely independent as to raw materials. Italy lacks coal and does not make much pig iron, but she has developed a good steel industry from imported material. Austria is dependent on foreign sources for coal. If she is to use English coal, as she has in the past, she must import it through territory that has been hostile to her. Poland has not the resources to develop more than a small iron industry. Switzerland, Holland, Denmark, and the new Baltic states have no resources of their own on which to base any extensive iron industry.

Discusses Treatment of Fluorspar Ore

Results of tests on the separation of sphalerite, silica and calcite from fluorspar are discussed by John Gross, metallurgist, bureau of mines, in a report just issued by the bureau. Southern Illinois and Kentucky are credited with approximately 90 per cent of the fluorspar production of the United States. A small amount of high-grade acid spar is obtained from the ore by hand sorting; the greater part, however, is recovered by jigs and tables as gravel spar containing approximately 85 per cent calcium fluoride. In the jigging and tabling operations, galena is recovered, and enough silica and calcite are removed to raise the calcium fluoride content of the gravel spar to 85 per cent. However, the removal of silica and calcite results in a large loss of spar. With increasing depth in the mines, zinc sulphide, sphalerite, is encountered in increasing quantity and the removal of this has become a serious problem. While the sphalerite can be fairly well removed from the spar by present milling methods, a marketable zinc concentrate cannot be made.

Tests were made on fluorspar ore from southern Illinois by the mining experiment station of the United States bureau of mines at Rolla, Mo., in co-operation with the Missouri School of Mines and Metallurgy. A comparison between electrostatic separation and flotation results leads to the conclusion that flotation will yield a slightly higher-grade zinc concentrate with a much higher recovery, but that a marketable spar can be obtained by flotation only by sacrificing a large amount with the silica and the calcite discarded on the tables, while practically any grade of spar can be obtained electrostatically. As there seems to be considerable doubt among mining men as to the reliability of operating electrostatically in wet weather, it is suggested that before an electrostatic installation is decided upon, a machine be tried on a working scale under all possible conditions.

Avoiding Compressor Troubles

Lubrication Is Big Factor in Care of Air Compressors—Oil Must Have Suitable Properties—Explosions of External and Internal Origin Can Be Prevented by Cleaning Accumulations Periodically—Compressors Usually Over-Lubricated

BY A. D. RISTEEN

MACHINERY is lubricated in order to reduce friction. Needless friction involves the expenditure of a correspondingly needless and therefore wasteful amount of mechanical energy. Friction causes the rubbing parts to wear away, which means overhauling and repairs. Heat, which develops where the friction occurs, is especially objectionable in an air compressor or any other mechanism that must be artificially cooled in any event, on account of the generation of heat from causes other than friction. Certainly there is no desire to develop avoidable additional heat in any place where it may be required to take special measures to remove the heat that necessarily is generated there. Another reason why lubrication is needed in the cylinder of a steam engine or an air compressor is, that it is important to seal the space around the piston effectively in order to prevent leakage under the piston rings, or between them and the walls of the cylinder.

The friction problem is not as simple as it looks. One authority declares friction is due to the interlocking of the little irregularities on the surfaces that are sliding or rubbing upon each other. Beyond doubt there is a considerable amount of truth in this theory, but it certainly does not tell the whole story. When dealing with surfaces that are appreciably rough, there is a certain amount of interlocking of the projections, comparable in a small way with the interlocking that occurs between the teeth of a pair of gears. To reduce this interlocking, and the consequent resistance to motion, sliding surfaces are made reasonably smooth,—reducing the projections until they are no longer of any practical importance; but even when the bearing surfaces appear to be absolutely smooth, friction is not wholly eliminated. Nor, after passing a certain stage, has it even been reduced in evident proportion to the increasing smoothness. A smooth bearing that is run without lubrication is likely to stick or "freeze", and although this action is attended by the development of heat, the temperature at which it occurs is usually far below the welding point.

Explaining Explosions

IN ADDITION to the routine problems of lubrication, involving consideration of the properties of the oil, its proper distribution to the points where it is needed, etc., there is the more infrequent problem of mysterious explosions. In the case of air compressors these may result from external or internal causes. The oil vapor theory is scouted by the author of the accompanying article, who contends that internal explosions generally are the result of accumulations of solid matter either drawn into the cylinder or formed by chemical changes from accumulated lubricating oil. The reader who is interested in the proper care of air compressors and similar machinery will find that Mr. Risteen not only outlines the theory of lubrication, but gives practical suggestions as to how the troubles of compressor operation may be avoided. The article is from a paper read before the engineering section of the National Safety council, Feb. 28, 1921, at Philadelphia. A. D. Risteen, the author, is associated with the Travelers Insurance Co., Hartford, Conn.

A lubricated shaft is usually thought of as floating on or in a film of oil, which is drawn into the space between the shaft and its bearing partly by the rotation of the shaft and partly by capillary attraction. This conception doubtless corresponds with the facts in large measure, yet it cannot be altogether correct, because if it were the friction would be wholly fluid friction, and it would be practically independent of the nature of the lubricated surfaces.

The fact that flotation is not the whole story may be shown by a simple experiment recently described by W. B. Hardy. To perform it a smooth, clean sheet of plate glass, and a glass weight with a similarly smooth, clean surface are required. The sheet of glass is placed in an inclined position, with the weight resting upon it near the upper end. By increasing the steepness of inclination of the plate, an angle presently is reached at which the weight will just slide down the plate freely. If the lower half of the plate is wet and the weight slides down as before, it stops as soon as it comes to the wet part. In repeating the experiment, using a glass weight as before, a polished sheet of ebonite is substituted for the plate of glass. If the steepness of the ebonite surface is adjusted so that the glass weight will not quite slide but is on the verge of doing so, it will be found that it slides down quite freely when the ebonite surface is wet with water. The water increases the friction in one case, therefore, and lessens it in the other. This shows the friction problem is complicated, even if attention is confined to the most elementary phases of it, and no account is taken of such things as the deterioration of the lubricant through use, or the means by which it is to be effectively applied to the surfaces.

In specifying an oil for lubrication purposes, it is customary to indicate the chemical nature of the oil in a general way, and to specify its density, its flash point, and its viscosity. It is universally agreed that the oil used for lubricating air compressor cylinders should be purely mineral. Oils of this nature may be divided into two general classes, which are known, respectively, as paraffin-base oils and asphaltic-base oils. The paraffin-base oils occur notably in the Pennsylvania region and the Appalachians, and the asphaltic-base oils are specially associated with the extreme South and West. The mid-continent oils may belong to either system, and some of them are mixtures of the two. Crude paraffin-base oils, upon distillation, leave solid residues consisting of hydrocarbons of the paraffin series; and the asphaltic-base oils, upon distillation, leave solid residues of an asphaltic or bituminous nature. The density of an oil is usually specified on the scale devised by Antoine Baume, a French chemist. In ac-

cordance with his plan, the density of a liquid is determined by immersing in it a float having a projecting stem which is graduated in accordance with a certain arbitrary plan. Two different methods of graduation are used, according as the liquid to be tested is lighter or heavier than water. In establishing his scale for oils and other liquids lighter than water, Baume immersed the float in a solution containing 10 parts of common salt to 90 of water, and the point at which the liquid then stood, on the stem, was defined to be "zero." The instrument was then placed in distilled water, and the point on the stem that was level with the surface of the water was marked and defined to be "10 degrees." Between these marks the stem was divided into 10 equal spaces or "degrees," and the rest of the stem was graduated in degrees of this same length. It would be much better and simpler to state the specific gravity of the oil, rather than to use such an arbitrary scale but the Baume hydrometer is in general use by oil men. Tables are given in many works of reference, to enable one to translate Baume readings into specific gravities, or the converse.

Viscosity is the quality that makes molasses run slowly in January. In oiling watches and other fine machinery, the viscosity of the lubricant must be very low; but in dealing with heavy machinery it is necessary to use an oil with a considerable amount of viscosity, so that the pressure to which the oil is subjected will not force it out of the bearings, nor wipe it off of the surface that is to be lubricated. For each particular lubrication problem, in fact the viscosity should lie within certain appropriate limits, which will vary according to the nature of the conditions to be met, and which must be ascertained by experience.

Temperature Affects Viscosity

The viscosity of an oil falls off with increasing temperature, and often to a great extent. In choosing an oil for use in a hot place like the interior of the cylinder of a steam engine, or a gasoline engine, or an air compressor, assurance should be had that the oil selected will have a suitable viscosity at the temperature at which it is to be used; and this may mean it is exceedingly thick at the ordinary room temperature.

In the United States, the viscosity of oils is determined mainly by means of an instrument devised for this purpose by G. M. Saybolt, although the United States government has in the past made considerable use of a similar instrument designed by Engler, and extensively employed in continental Europe. The main objection to the Saybolt apparatus has been, that until recently its construction and mode of use have not been sufficiently standardized. This has recently been remedied, in large measure, by the American Society for Testing Materials and the United States bureau of standards and it is likely that hereafter the Saybolt universal viscosimeter will be the standard instrument in this country for the practical determination of oil viscosity. In using it, 60 cubic centimeters of the oil to be tested are allowed to flow into a receiver from a glass tube of specified shape and dimensions, and the number of seconds that are required is taken as the measure of the viscosity. Thus when it is said an oil has a viscosity of "140 S" (the "S" standing for "Saybolt"), it is meant that 60 cubic centimeters of the oil will flow out of the standard tube in 140 seconds.

The flash point of an oil is the lowest temperature at which the oil gives off a vapor that can be ignited by means of a flame or an electric spark. The temperature at which actual ignition occurs without the application of flame or an electric spark is totally different and is called the fire test or ignition point. It is important to remember this distinction in discussing air-compressor explosions; yet often the flash point erroneously is referred to as though it were the temperature at which an oil will burst into flame spontaneously. In the United States, flash points are determined by means of the so-called "open cup" apparatus, in which the oil under examination is gradually heated until the vapor from it can be ignited by a flame or spark, the temperature at which this first becomes possible being noted by a thermometer, and recorded as the flash point.

In lubricating the cylinder of an air compressor, an oil must be viscous enough to resist the tendency of the piston to wipe it off and leave the metal surface dry; but the viscosity should not be great enough to offer any considerable opposition to the motion of the piston. It must be remembered that lubrication is intended to diminish friction, as well as to seal the piston so that air cannot leak around it. The errors made in selecting oils for lubricating air compressor cylinders probably tend toward a viscosity that is too high instead of too low. The Compressed Air society gives the average viscosity as from 230 to 315 seconds on the Saybolt scale for paraffin-base oils, and from 275 to 325 for asphaltic-base oils. The minimum limits for viscosity in good practice are given as 120 S. for paraffin-base oils and 175 S. for asphaltic-base oils.

The average density for good practice is given as 25 to 30 degrees Baume for paraffin-base oils, with a minimum of 32 degrees and a maximum of 25 degrees; and as 19.0 to 21 degrees Baume for asphaltic-base oils, with a minimum of 22 degrees and a maximum of 19.5 degrees.

In connection with flash-point tests the society recommends 400 to 425 degrees Fahr. as good average practice for paraffin-base oils, and 315 to 335 degrees Fahr. for asphaltic-base oils, the fire test being higher than the flash point by about 50 degrees in the paraffin-base oils, and by from 55 to 65 degrees in the asphaltic-base oils.

Explosions of External Origin

In considering the relation of lubrication to air compressor explosions, we may note that these accidents sometimes are due to causes external to the air end of the machine. As an example of an explosion initiated by an external cause, yet having a certain bearing upon the lubrication problem, I may cite a case in which the steam pipe running to the compressor failed, doing considerable damage in a small way to the machine, and incidentally causing the rupture of the air pipe and liberating the contents of the receiver. Shortly after this occurred there was a violent secondary explosion, which blew out the whole side of the building. It is believed that there was considerable oil in the bottom of the receiver, and that the escaping air blew this oil out into the room in the form of a fine spray. A battery of boilers was located in the same room, and we may reasonably suppose that the spray took fire at one of the furnaces. A couple of gallons of oil disseminated through the air in the form of mist could easily give rise to a violent explosion, when brought in contact with flame or with a bed of white-hot coals.

It is bad practice to allow considerable quantities of oil to accumulate in a receiver tank, or in any other part of the air system. Every receiver tank should be provided with

a drain pipe having a diameter of at least half an inch, and preferably three-quarters of an inch; and these drains should be opened frequently and regularly, to remove any oil or water that may collect in the receivers.

However, we are mainly interested in explosions of something inside the compressor or its piping or other connections, and in considering these we naturally ask what there is inside of the compressor or its connections that can explode.

The free solid matter found in the cylinders, piping, and receivers of air compressors is of two general kinds. First, it contains whatever may have been introduced into the air compressor in solid form, such as dust drawn in through the intake. The dust held in suspension by the air taken into the compressor usually contains more or less mineral matter, which is likely to be either sandy or clay-like. Such matter is incombustible, and probably would not be directly harmful except as it may increase the friction and the wear. But the incoming air may also contain combustible material. The combustible matter may be of an organic nature, or it may consist largely of particles of carbon. This last condition is most likely to prevail when the intake of the compressor is located near a coal pile, or where it can take in more or less smoke from a chimney or stack. To prevent accumulations of this kind, it is highly important to draw in the air from a place as free from dust as possible. It would be wise to filter the air through dust-proof and smoke-proof screens, before allowing it to enter the compressor. However, this is not always practicable.

Carbonization of the Oil

The other source of solid matter in the cylinder or receiver or connections is the so-called carbonization of the oil itself. We speak of solid deposits of this nature as carbon, but although they contain free carbon, they consist largely of oil in various stages of disintegration, and of compounds formed from the oil under the influence of heat and the oxygen of the air. An exhaustive treatise on the carbonization of lubricating oils, covering the nature of the deposit and the theory of its formation, appears in Circular No. 99 of the United States bureau of standards, 1920. Carbonization is due in large measure to the use of improper oil, or of an excessive amount of oil. The oil should have such a composition that it is reasonably stable, at the temperatures that are likely to occur in the compressor or its connections. This means that it should not contain any animal or vegetable constituents, but should be purely mineral. However, any oil will undergo a certain amount of decomposition under the conditions to which it is exposed in air compression apparatus. Slow oxidation is favored by the fact that the oil is spread out in a thin layer and exposed to heated air. Moreover, at the temperatures prevailing in the apparatus, the oil is likely to break down, slowly, with the formation of somewhat lighter oils, and the simultaneous liberation of a certain amount of free carbon. No oil that is worth even momentary consideration contains any free carbon in its original state and the percentage of carbon present in the oil in combination with hydrogen is no criterion whatsoever of the likelihood of the oil to deposit carbon. The carbon deposits thrown down by paraffin-base oils are said to be hard, gritty, and specially adhesive, while those that are derived from asphaltic-base oils are described as fluffy and easily removable. However that may be, it is certain that any oil that gives a considerable deposit of so-called carbon is objectionable in connection with air compressor lubrication, whatever the nature of the deposit may be. For example, the carbon may interfere with the valves of the compressor, and prevent them from closing properly.

Ignition of the Carbon

It is well known that these carbon deposits take fire, at times, when the conditions are favorable; and this can hardly be due to the air in the compressor attaining a temperature high enough to ignite pure carbon, especially when the carbon is in compact form. Bearing in mind the fact that the deposits seldom or never consist of pure carbon, but contain considerable quantities of decomposed oil and other substances, we can get a glimpse of certain interesting chemical possibilities.

It is not unlikely that the free carbon present in the deposits occasionally acts as a catalyzer, in promoting the rapid oxidation of the oily matter with which it is associated. Catalysis plays an important part in modern chemical manufacturing, and we are enabled, by means of it, to bring about many chemical reactions that will not occur unless a suitable catalytic agent is present. Charcoal and coke are among the substances used, in this way, to promote certain chemical actions; and perhaps it is not unreasonable to assume that the carbon in a compressor or its connections may sometimes induce rapid oxidation of the oily matter. It is known, too, that some of the products that would be formed in this way are themselves capable of acting as catalyzers, so that they might accelerate the action when it had once become well started. Fine metallic particles, worn off from the cylinder or the piston, are sometimes present in the deposit, and iron oxide often occurs to a significant extent. Both are active catalyzers under certain conditions.

Heat Facilitates Action

The heat generated by the beginnings of the oxidation would facilitate further action, and so the process would go on, until presently we might have a glowing or burning mass. This in itself might precipitate an explosion, by heating the metal walls so that they could no longer withstand the normal air pressure to which they are subject. Furthermore, the carbon deposit, if it happens to be of a light and fluffy nature, may be disturbed so that a dust explosion occurs, the finely divided carbon playing the part of the dust and the ignition taking place in consequence of the catalytic firing of the oily matter. Even if the carbon deposit were originally compact and hard, it might take on a loose, sooty character as soon as the oily matter combined with it had burned away. One investigator has calculated the amount of carbon dust that would be required to give an explosion comparable in violence with those that have been recorded, and he finds that if the carbon ignited in the form of dust were sufficient in amount to fill half a cubic inch when compressed into compact form, we should have enough explosive material to explain any accident of this type that might be cited. However, in the writer's opinion, it is only the carbon that explodes.

Hard carbon deposits often prevent the valves of a compressor from closing properly, and this is likely to cause serious overheating. The piston, in making its return stroke to fill the cylinder with a fresh charge of air, will be followed by a certain amount of the compressed and therefore heated air, flowing back through the leaky valves from the receiver and its connections. Under these circumstances, the contents of the cylinder are already, and before the compression begins, at a temperature considerably higher than that of the surrounding atmosphere. Therefore when the next compression stroke is completed, the temperature in the cylinder may be a good deal higher than it would be if the valves were tight. The increase in temperature produced in this way, and also by the friction of the air in churning back and forth through the restricted valve opening, naturally accelerates any tendency toward the production of fire and is, therefore, a serious matter.

Every effort should be made to pre-

vent the accumulation of carbon deposits anywhere about the compression apparatus, and such matter as may be deposited in spite of all reasonable precautions in the way of selecting the oil and feeding it to the cylinder should be cleaned away frequently and regularly. Much can be accomplished in the way of cleaning the compression apparatus by discontinuing the oil from time to time and feeding soapy water into the cylinder for two or three hours—say once a week. This helps to clean out carbon deposits and deposits of gummy oil. The soap solution may be made up of one pound of soft soap to seven or eight quarts of water, and it is advisable to feed it into the cylinders at a rate about like 10 times as great as the rate at which the oil is ordinarily supplied. The frequency with which this treatment should be given depends upon the experience that has been had with the particular air compressor under consideration. Some authorities recommend the introduction of a solution of lye into the pipe between the cylinder and the receiver every month or two. The lye solution may be made up by using one pound of lye to eight or 10 quarts of water, and it may be delivered into the air discharge pipe by means of a sight-feed lubricator at the rate of 60 to 70 drops per minute. After using the lye or the soap solution, the receiver should be blown off, and oil should again be used in the cylinder for a time, before stopping the compressor. Otherwise rusting is likely to occur.

When hard carbon deposits form, which are not removable by the treatment here suggested, they should be

(*Concluded on Page* 495)

Mechanical Appliances Aid Efficiency of Historic Furnace

BY E. C. KREUTZBERG

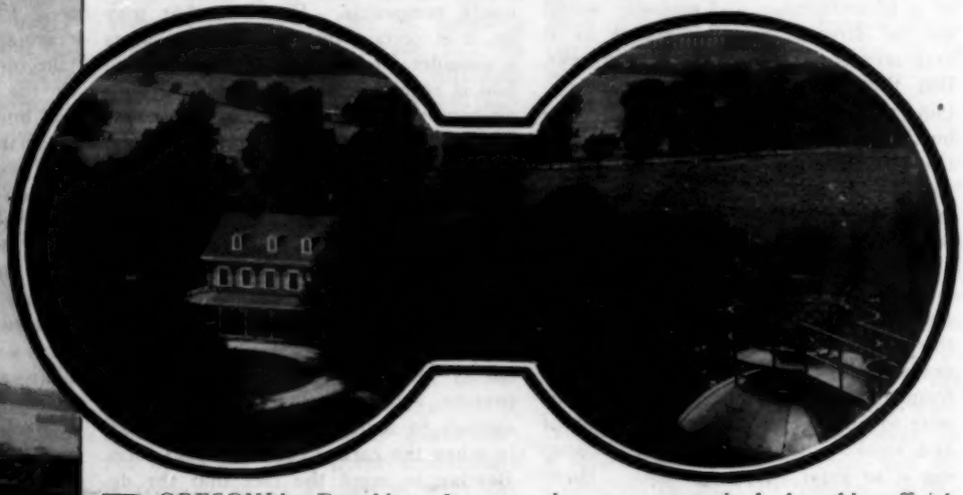


Fig. 1—View of the top of Robesonia furnace, showing the new receiving hopper and rotating top. The inset (Fig. 2 at right) is a view from the top of the stack showing the top of one of the stoves at the extreme right, and in the left center the historic Mansion House, built in 1803. Iron was made on the site of the present furnace in October, 1793, by George Ege, who operated it under the name of Reading furnace. The original stack was replaced in 1885 by a new furnace with fire brick stoves, new engines and other improved auxiliaries of that period. The present stack was built in 1915.

ROBESONIA, Pa., blast furnace of the Robesonia Iron Co., Ltd., takes its place with the modern merchant stacks of the country as a result of important additions and improvements which were installed during the 6-month period of idleness prior to the blowing in of the furnace July 5. No changes were made in the stack, which is of heavy construction and relatively new, having been built in 1915, but it was fitted with a new top and automatic skip, steel stock bins and an ore handling crane, thus doing away with the handfilling methods formerly employed. An unusual feature, for work of this kind accomplished by a merchant furnace company, is that it was done entirely without outside engineering assistance. The extensions and improvements were designed entirely by the company's superintendent, John W. Gocher, formerly chief engineer of the Cambria Steel Co., and the work of erection also was supervised by this official.

The top, which is of the McKee patented revolving type, is shown in Fig. 1. Above the top, a double I-beam trolley runway spans the top of the furnace and projects sufficiently beyond the top platform to permit bells, hoppers and other top parts to be hoisted direct from cars on standard gage tracks at ground level. The skip is of the single-pocket type with counterweight. Discharging, as it does, exactly on the center of the small bell, this skip affords an excellent distribution of stock, even when the rotating feature of the McKee top is not utilized. The lower end of the comparatively light skip bridge which is shown in Fig. 6, rests on foundations at ground level and the upper end is supported by pin-connected columns resting on the old charging floor. The latter was suitably reinforced for that purpose. The receiving hopper is suspended from the

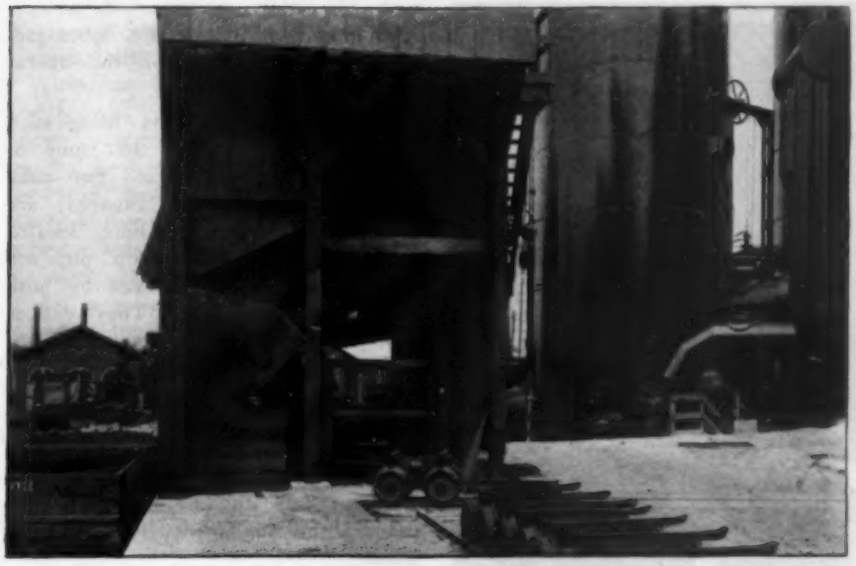


FIG. 3—NEW LOADING HOUSE SHOWING ELEVATOR. THE LOWER CHUTE IS TILTED BACK FOR CAR CLEARANCE

bridge. The counterweight runs in vertical guides located beside the skip bridge, the top sheave for the counterweight rope being at the level of the old charging floor and easily accessible. The travel of the counterweight is half that of the skip bucket.

Of the usual standard type with double-tread wheels in the rear, the skip bucket has capacity for 120 cubic feet. From it two 1-inch diameter hoisting ropes run over a double-grooved head sheave, supported on the top of the skip bridge and easily accessible by stairway and platform, and down to the main drum of a 14 x 14-inch Otis hoisting engine. An extension of the hoisting engine drum takes care of the 1⅛-inch counterweight rope which passes from the engine drum to the counterweight and back to the top of the counterweight frame, where it is anchored. The groove on the counterweight drum terminates in a spiral which automatically decreases the effective counterweight pull when the skip bucket is discharging its load.

An engine house built above the skip bridge, but resting on its own foundations, houses the hoist engine. This is of heavy construction, amply braced, and the heavy I-beam floor structure to which the engine is bolted, is filled with reinforced concrete. It is large and roomy, and contains, beside the hoisting engine, the electrical control board used for the revolving top.

From the stock bins, ore and limestone are delivered to the skip car in a standard McKee type electrically-driven scale car, having 100-cubic feet capacity. The car and its runway are shown in Fig. 5. The design of the stock bins was determined somewhat by local conditions, permissible grades on the approach tracks compelling more excavation than would otherwise have been necessary. The bin framework is of structural steel of heavy section.

Two standard gage tracks are supported on track beams, framed into heavy cross girders which also help to support the load in the bins. These girders are spaced 16 feet, 7 inches apart, which determines the length of individual bins. The column supporting one end of the girder is extended above the track to support the runway girder for the ore handling crane, this girder being placed at such height that men unloading cars into the bins cannot reach the runway rail. Between these main girders are placed intermediate frames, one end resting directly on the longitudinal wall of the scale-car pit and the other being framed into a longitudinal girder between the main columns. These frames support the bin floor and also serve for fastening the bin doors. The bin floors are of wood, and are made double, the heavy sub-floor being covered by a lighter wearing surface of fine-grained wood.

One of the standard gage tracks is used to deliver materials into the bins, while under the other an inclined slide will deliver material

FIG. 4—VIEW FROM SOUTH SHOWING PARTLY ERECTED ORE HANDLING CRANE, AND BINS AND FURNACE. THE SLAG PILE IN THE DISTANCE IS A PORTION OF ONE WHICH HAS BEEN ACCUMULATING FOR 127 YEARS

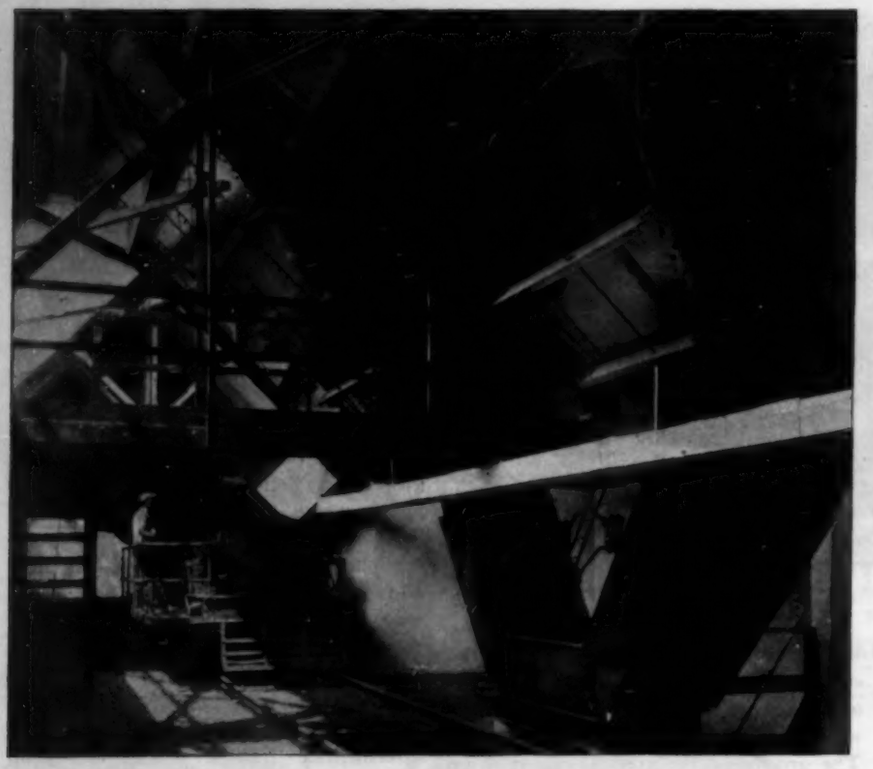


FIG. 5—COKE BINS AND CHUTES SHOWING SCALE CAR RUNWAY AND SCALE CAR IN BACKGROUND

dropped from cars into the stockyards. This material subsequently will be handled by the ore-handling crane. Due to this construction, and the necessity for ample clearance between the tracks on top of the bins, the scale-car pit is unusually roomy, and, with the walls whitewashed, a reasonable number of electric lights furnish plenty of light for the operator.

Sixteen ore and stone bins, each with capacity of about 160 tons of ore of average weight, and two coke bins, each of 80 tons capacity, are provided. These coke bins, located on each side of the skip pit, are 26 feet long and are served by both tracks over the bins. They deliver coke directly into the skip bucket, through chutes controlled by gates operated from the scale-car pit floor level, the coke passing over sectional screens of McKee patented type. Coke screenings later will be delivered by conveyor into suitable bins, but this part of the equipment is not yet in place.

The operator's house is placed directly above the skip pit, between the coke bins. From it are controlled the operation of the hoist engine, the large and small bells and the test rods, electric signals showing the movements of the bells and of the revolving top. The operator also can see, through floor gratings, the filling of the skip car, and keep in constant touch with the scale-car operator.

The ore storage yard, shown in Fig. 4, is equipped with an Alliance Machine Co. ore-handling crane, equipped with a 5-ton Hulett bucket. Installation of this crane has not yet been completed. It is 100 feet, center to center of runway rails with cantilever ends, which make the total length 172 feet. The distance from the stockyard floor to the top of the crane bridge rail is 62 feet. The operator will travel on the trolley and all movements of

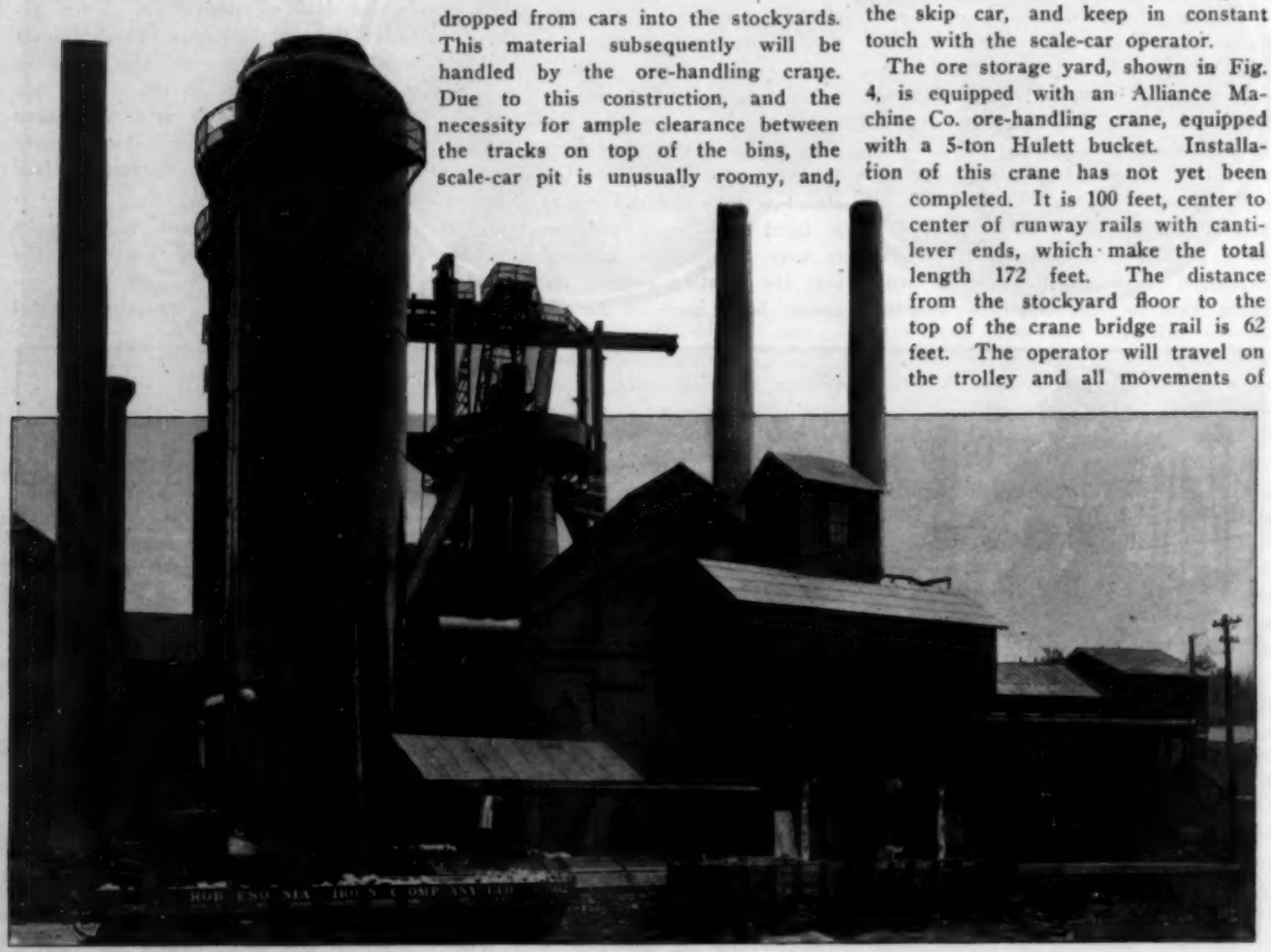


FIG. 6—FRONT OF NEW LOADING HOUSE, SHOWING ARRANGEMENT FOR BREAKING PIGS AS THEY ARE LOADED INTO CARS. THE STOVES AND STACKS ARE SHOWN IN THE BACKGROUND

the crane will be controlled in accordance with the best practice.

While no change has been made, and none is contemplated, in the company's practice of making sand-cast iron, a new arrangement for loading pig iron has been installed. This involves the use of an electrically-operated, automatic elevator whereby pig iron, as it comes from the cast house, is raised to a sufficient height to be dropped on breakers as it is loaded into cars. By this practice, a small half pig, weighing about 65 pounds, is provided. The loading house is shown in Figs. 3 and 6.

The product of the Robesonia Iron Co., Ltd., as in the past, will be mainly low-phosphorus pig iron for steelmaking purposes, but foundry, malleable and bessemer grades also will be produced. The present capacity of the furnace is 200 tons per day. Further improvements to its plant and increased capacity are contemplated by the company, but no active work is being done at this time.

Compressor Troubles

(*Concluded from Page* 492)

cleaned out by whatever means may suggest itself as most effective. For instance, the air valves should be removed whenever necessary and cleaned by mechanical means. However, no kerosene or other inflammable solvent should be introduced with the air. This practice, which is far from unknown, is exceedingly dangerous.

Quantity of Oil Required

Now, as to the amount of oil that should be used. As a rule, air compressors are over-lubricated. The walls of compressor cylinders are dry, and oil sticks to them far better than it does to the cylinder of a steam engine. Therefore, it is not necessary to use as much oil in the air compressor. Roughly speaking, the amount used in a compressor cylinder should never exceed one-quarter the amount that would be used in a steam cylinder of equal size, and a smaller quantity than this usually is preferable. Some authorities state that it is advisable to use only one-tenth the quantity that would be required in a steam cylinder of like capacity. It is not practicable to make a hard-and-fast rule covering this point, because it is necessary to allow considerable latitude on account of variations in the oil, and in the working conditions. The best plan is to remove a valve from time to time, and examine the condition of the cylinder surface. If it is covered with a thin film of oil, the lubrication is at all events sufficient; but if it is dry, more oil should be supplied. The quantity of oil used should be as small as is consistent with the maintenance of the oil film.

Care of the Cooling Jackets

If the water circulated through the cooling jackets contains much scale-forming matter, a solid, stony coating is likely to form on the cylinder wall side of the jacket, and this will naturally diminish the cooling effect of the jacket, and allow the cylinder wall to become needlessly hot. Heavy accumulations of a muddy or sandy nature are also likely to form in the water jackets, when the water contains considerable quantities of sediment, and in a bad case of this kind the jacket space may be entirely filled up, except for a small channel extending through the deposit from inlet to outlet. A jacket in this condition is useless as a cooling device.

The jackets should be watched for evidence of deposits of sediment or scale, and whenever anything of this kind is found, it should be removed by appropriate means. It may be possible to wash out the mud by using a strong stream of water, stirring up the deposit if necessary by means of a flexible rod. When a stony deposit of scale is found, it should be removed by filling the jacket with a hot solution of caustic soda or some other suitable substance. If there is much trouble of this kind, the water should be purified before admitting it to the jacket or the source of supply should be changed. Where trouble is experienced from sediment, the water should either be filtered before use, or be allowed to stand in large settling tanks until it clears.

In any event the supply of water should be abundant, and the man in charge should know with the utmost positiveness that there is a free flow through each jacket. The best way to make sure of this is by having the discharge from the jacket visible, and locating it in a conspicuous place, so that any significant lessening in the quantity of escaping water will be noticed at once.

Iron Ore Deposit Found in Canada

An iron ore deposit has been discovered in Canada 67 miles north of Sprague and 100 miles from Sault Ste. Marie, Ont., by Col. J. A. Currie, Toronto, member of parliament for North Simcoe, and Archibald M. Campbell, geologists. The vein is two and a quarter miles long and about half a mile wide, according to Mr. Campbell, and is steel-blue specular hematite ore, bessemer grade, low in phosphorus and without magnetite.

According to Col. Currie, the first discovery of ore in this region was made by the Herrick survey expedition in 1857, which explored the Blind river country as far north as the forest reserve. Iron deposits were marked by Herrick, but were forgotten for years until 1903, when the Helen mine was beginning to produce great quantities of ore. In 1862 Herrick led an expedition which ran a line from Sault Ste. Marie to Fort William, and on this trip he marked both the Helen mine and the Magpie mine. These marks were afterward discovered. Both mines have paid large dividends. In 1903 one of the men who had been with Herrick told Col. Currie of the circumstances attending the finding of these two claims and also of other deposits marked by Herrick. The latter were but recently traced. The new claims are 35 miles from a railroad, but are said to be accessible by an old logging road.

Work Progresses on New Canada Steel Plant

Construction of the steel plant being built by the Canadian Steel Corp., a subsidiary of the United States Steel Corp., at Ojibway, Ont., opposite Detroit, is progressing. Concrete roadways and sewers have been laid on the plant area which embraces 1400 acres along the Detroit river. A modern concrete slip, capable of accommodating six vessels at one time, is practically completed.

Steelwork for seven blast furnace stoves has been erected and No. 1 furnace now is being constructed. Steelwork for the wire mill and machine shop is up and the latter has been enclosed. The plant when completed will be the largest steelworks in the Detroit district and in Canada, it is reported.

More than 300 machinists, boiler makers, blacksmiths, sheet metal workers and car men employed by the Cincinnati, Indianapolis & Western railroad went on a strike recently as a protest against the discharge of two machinists and two machinists' helpers, after they had refused to work overtime without receiving pay for time and a half. Robert G. McArthur, secretary of the union to which most of the striking machinists belong, said the walkout was not authorized by the union.

American Malleable Cast Iron

A Series of Related Articles Dealing with the Development of the Industry, Modern Methods of Manufacture, Metallurgical Principles Involved and the Properties of American Malleable Iron

BY H. A. SCHWARTZ

Chapter XVII — Patternmaking and Molding

IN MANY respects, patternmaking and molding practice in malleable plants does not differ from that in other branches of the foundry industry. The various devices adopted for repetitive work in gray iron or brass also are found in use in the malleable shop. Indeed, since the producers of malleable engage largely in the manufacture of small and moderate sized parts in large numbers the development perhaps is further advanced than in gray iron practice. However, there are certain vital differences between patternmaking and molding for malleable cast iron as distinguished from the same operations in the gray iron trade. These differences arise from the metallurgical properties of the two materials.

The two essential distinctions between white iron and gray iron lie in the melting point and shrinkage of the two metals. Gray iron castings of moderate size are made of metal containing, for example, 3.25 per cent carbon, 2.00 silicon and 0.50 phosphorus as compared with the composition of white cast iron which approximates 2.50 per cent carbon, 0.75 silicon and 0.19 phosphorus. The equilibrium diagram for the iron carbon alloys shows that all alloys above 2 per cent in carbon finish freezing at the same temperature—1130 degrees Cent. or 2066 degrees Fahr. It shows further that the point where freezing begins varies with the carbon, decreasing nearly uniformly from 1550 to 1130 degrees Cent. as the carbon increases from nothing to 4.3 per cent.

Leaving the other elements out of consideration, the white iron should begin to freeze at roughly 1310 degrees Cent. or 2390 degrees Fahr. and the gray iron at 1220 degrees Cent. or 2250 degrees Fahr.

Thus gray iron will be completely liquid at a temperature 140 degrees Fahr. lower than that at which white cast iron has begun to solidify and the range of partial solidification or pastiness is larger by that amount in white cast iron than in gray iron.

The presence of silicon still further accentuates this point. According to Gontermann's data, metal of the composition assumed for gray iron should begin to freeze at about 1200 degrees Cent. or 2190 degrees Fahr. and be completely frozen at 1140 degrees Cent. or 2080 degrees Fahr., whereas white cast iron should begin to freeze at 1330 degrees Cent. or 2420 degrees Fahr. and finish the process at 1170 degrees Cent. or 2140 degrees Fahr.

The data are not exactly in accord with those based on carbon alone, due to minor differences in the observations on which the data were based. The point to be clearly brought out is the higher point of incipient freezing and longer partially frozen range for white cast iron than for gray iron. The presence of phosphorus in larger amount in the latter still further accentuates the difference, although the writer has no available data on the freezing conditions in the system Fe-Si-P-C.

Should Pour at Higher Temperature

The data given show clearly that white cast iron must be poured at a much higher temperature than gray iron, since the latter will be liquid at a temperature perhaps 230 degrees Fahr. below that where the former has begun to set. Furthermore, it is quite possible that the fluidity of white iron when at a temperature say 100 degrees Fahr. above its freezing point is materially less than that of gray iron at the same temperature above its freezing point.

Within the author's knowledge data on this point are lacking. A further corollary of the difference in freezing conditions is that other things being equal there will be more shrinks or porous areas in white than in gray iron castings. This arises from the longer freezing range of the former corresponding to a larger fluid contraction of the still liquid alloy between the time and temperature of incipient and complete solidification. The consequence of this increased fluid contraction is that as the temperature of complete freezing is approached there no longer remains a sufficient volume of liquid to fill the voids in the previously formed solid skeleton.

Therefore, in the last freezing areas, voids remain between the dendritic crystals of the first frozen solid.

The shorter the freezing range the less of this contraction that can occur. It has been shown that liquid iron is a solution of cementite in iron and Wüst and Peterson have demonstrated that all such alloys freeze as cementite and austenite. However, in the temperature interval just under freezing the higher silicon and carbon metals graphitize by the conversion of cementite into iron and carbon.

The iron resulting from this reaction occupies almost the same volume as the original cementite. The total volume therefore is increased almost by the volume of carbon liberated. As a consequence there is a tendency to expansion at these higher temperatures. A number of observers especially Turner have recorded actual increase in linear dimensions while the metal was cooling and therefore contracting, just under the freezing point.

The expansion due to graphitization is important in two respects. It causes the casting to be only about 1 per cent smaller in linear dimensions (3 per cent by volume) than the pattern instead of double these values for white iron, and also tends to fill up in part the voids left by fluid contraction.

The difference in pattern equipment and molding methods in the malleable as compared with gray iron industries are due to the necessity for providing against the following differences in the properties of the two metals.

1. The higher melting point and lower fluidity of white iron.
2. Its greater tendency to internal shrinkage due to fluid contraction.
3. Its greater shrinkage from pattern size.

It will be noticed that the noun "shrinkage" has two distinct but related meanings to foundrymen. One refers to the reduction in the overall dimensions of the casting as compared with the pattern and the other to the production of porosities due to voids left

by the contraction of the fluid metal.

A distinction based on the words "solid contraction" and "fluid contraction" seems desirable but has not gained favor among foundrymen. Accordingly one must be constantly on the alert to avoid confusion due to the indiscriminate use of the term "shrinkage."

Speaking first of this property in the sense of solid contraction, the fact that the shrinkage of white iron is about ¼-inch per foot instead of ⅛-inch per foot in gray iron does not cause any difficulty in patternmaking, except that a proper allowance must be made by using a "double" or ¼-inch shrink rule in laying out the work in case the casting is to be used hard. This shrink rule is merely a rule graduated in feet and inches and fractions of inches—usually sixteenths—in which the distance marked as one foot is 12.25 inches. A casting from this pattern will come from the mold about true to size.

Experiment has shown that the solid contraction of white cast iron (metastable carbon iron alloys) is substantially the same irrespective of composition. The contraction in cooling from solidification to room temperature is graphically shown in Fig. 3.

On annealing the casting expands due to the fact that temper carbon and ferrite occupy a considerably greater volume than the cementite from which they are formed. The increase in volume and in linear dimensions, depends primarily on the original total carbon and to a less degree on the heat treatment by which the graphitization is attained and possibly on other more obscure circumstances.

Dimensions Determined By Trial

The expansion is assumed to be about ½ of the original contraction so that the shrinkage allowance in patternmaking for malleable is the same as in gray iron, the standard or ⅛-inch shrink rule being used. However this is true only with metal containing about 2.40 per cent carbon; with higher carbon this allowance will produce castings which are too large. The changes of shape produced by relieving shrinkage strain in irregular castings also introduce variables.

Therefore it often is necessary to arrive at the pattern size for important dimensions by actual trial and even then the castings will come true to size only so long as temperature of pouring, chemical composition, and sometimes even the solidity of sand and cores are maintained exactly constant.

The heavy solid contraction of the white cast iron also impose a number of difficulties which would not be clear to the reader were he to consider the

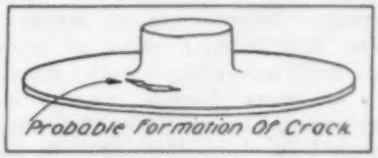


FIG. 1—CASTING WITH THIN DISK AND THICK HUB, SHOWING PROBABLE POINT OF RUPTURE

problem altogether from the standpoint of the net shrinkage of the fininshed product. It has been said that the total contraction of all white cast iron is constant. However, it is at least unusual that all parts of a given casting cool at the same rate. In other words, in practically every casting some parts arrive at their final temperature, and therefore final size, ahead of others. This may develop excessive stresses or even distort or disrupt the casting.

Consider a casting having the form of a thin disk with a heavy hub at the center, as shown in Fig. 1. The hub will be hot and possibly almost fluid when the light disk has already set and cooled to nearly room temperature. The contraction of the disk during this cooling has met but little resistance from the hot and plastic center. However, when the latter begins to cool, its reduction in dimensions will be resisted by its attachment to the solid thin flange. Sometime this attachment will be so secure as to permanently stretch the pasty mass within. If this can not occur the flange may be torn loose from the hub at one or more places or may even be entirely detached.

In the reverse case of a thin plate surrounded by a thick rim, as shown in Fig. 2, the contraction of the rim would be opposed by the previously solidified center, either crushing the center or producing a radial tear in the rim. Generally the point of failure is at or near the hottest part of the casting where the strength is the least. Occasionally no external defect results

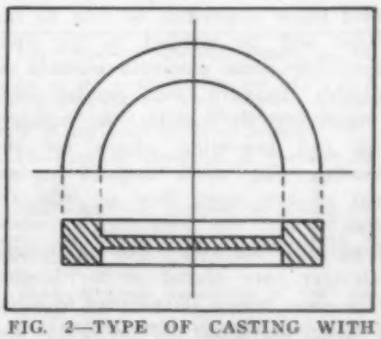


FIG. 2—TYPE OF CASTING WITH THIN DISK CENTER AND THICK RIM

due to the welding up of such defects by molten metal from the center. Then the consequence is a pipe or other void.

The magnitude of the stresses from this source may be enormous, depending only on how rigidly the last cooling portions are held by their solid surroundings. In gray iron the difficulty is less pronounced due to the lower magnitude of the contraction and to the fact that the solid portions can be deformed slightly without breaking, whereas practically no distortion is possible in the hard iron.

Effect on Design of Castings

The practical application of this reasoning is that, in the design of parts to be made of malleable cast iron great care must be used to avoid such forms and proportions as will rigidly connect parts of widely different cross section. All sections should merge uniformly into each other, avoiding abrupt changes of thickness. Fairly thin ribs intended to rigidly brace heavier sections, spoked wheels with hubs heavier than the rim and in general any design in which unequal rates of cooling can set up opposing stresses should be avoided. If such designs are successfully executed by the foundryman it is only by methods of gating or chilling calculated to accelerate the cooling of the heavier sections and retard that of the lighter. This calls for the exercise of great skill and judgment and may produce prohibitively higher losses with a corresponding increase in cost.

We may now consider the shrinkage produced by fluid contraction and resulting in porous material in the areas freezing last. It is impossible to surpress these so called shrinks in any casting. Their formation is inseparably connected with selective freezing over a temperature interval and hence always occur in every casting.

Depending on particular conditions, these shrinks may be widely distributed in insignificant amount at any one place, or they may be concentrated in one spot, aggregating a considerable volume. A casting freezing at a nearly uniform rate throughout, due to equality of section, etc., and freezing almost as rapidly as the iron enters the mold may have the porosity so uniformly distributed and so nearly filled up from the ladle during pouring as to be practically sound. On the other hand, a casting having a heavy cross section in some one place which is fluid long after pouring ceases will show a great shrink, especially if the heavy section is high up in the mold.

Two remedies are employed for this trouble. The older is the application of iron chills, which are pieces of

cast iron buried in the mold so that they form its inner surface at the points where shrinkage is prevalent. By accelerating freezing they suppress the shrink in their immediate vicinity. However, since the reduction in volume still exists an equal volume of shrinkage will develop elsewhere. This practice is good if the shrink in the new location does no harm, or if in that location it can be suppressed by feeding; otherwise it is merely camouflage. Continuously supplying molten iron until the entire casting is frozen is the only actual preventive of shrinks.

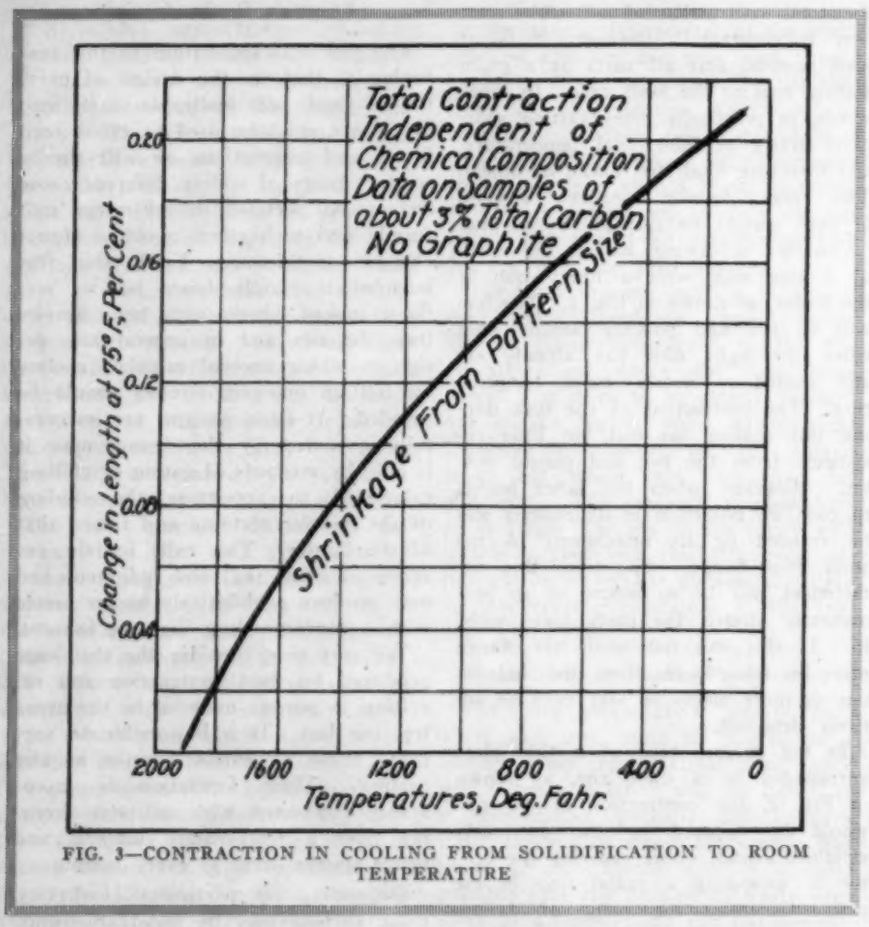


FIG. 3—CONTRACTION IN COOLING FROM SOLIDIFICATION TO ROOM TEMPERATURE

The shrink always is found in the slowest freezing locality. Therefore, if to the pattern there is attached a feeder of still slower cooling rate so located that metal can flow from it to the location in which the shrink was found, then the shrink will be transferred to this feeder and be of no consequence, since the feeder is not a part of the finished product. The actual design of feeders, to meet a given set of conditions may require much skill and experience, but the operating principle is simple.

Feeders are expensive, not only from the molding viewpoint but also because they involve the melting of much additional iron. Nevertheless their use is the safest possible foundry practice to insure sound castings.

The high freezing point of white cast iron necessitates much greater care in gating than is requisite for gray iron. The relatively thin gates commonly used for that metal do not admit of a sufficiently rapid flow to prevent freezing before the mold is filled. Most castings must have metal admitted at a number of points in order to permit the mold to fill sufficiently rapid. Because of the large gates, it is necessary to use special means to exclude slag or sand floating with the current of metal. The thin knife gates of the gray iron industry will choke the stream enough to permit these impurities to rise to the surface and be trapped in the runners. The same principle is used in malleable foundry but greater care is necessary in making the runners large and providing places for the ascending slag to be trapped on account of the rapid flow of iron required.

Frequently the iron is poured through a strainer core placed at the bottom of the riser, which is intended to cause the latter to remain full of metal and allow the slag to accumulate and float up.

Because of the quick filling of the mold, necessitated by the quick freezing of the iron, great care must be used in selecting molding sands, in venting the mold. The air and gas must be able to escape rapidly enough to allow the iron to enter at the rate required to keep it from freezing before the mold is filled.

The selection of molding and core sands and of core binders, as well as the actual ramming of the sand are further influenced by the high solid contraction of white cast iron. The mold and cores must be made so as to give readily under the heavy contraction of the casting in freezing. If for instance, a core be so hard as not to disintegrate before the metal begins to shrink it may set up such a strain in the casting as to actually cause rupture.

The patternmaker can frequently save the consumer money by a judicious selection of the number of pieces made in one mold. A further discussion of this matter will be found in a later chapter.

Any attempt to increase the weight per mold by putting in so many pieces as to cause pouring difficulties or to prohibitively increase the dimensions of the mold is not justifiable.

In general the steps in the improvement of molding methods have been as follows:

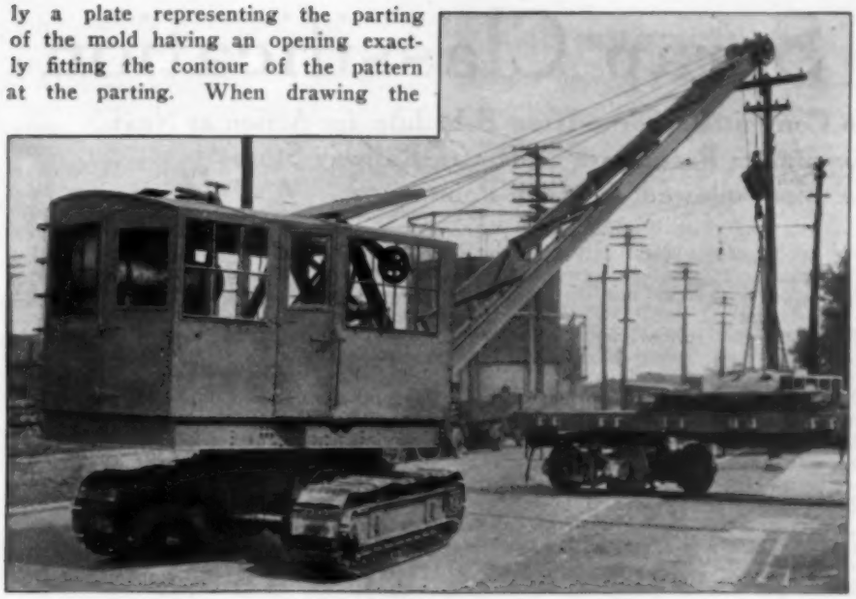
Starting with a plain pattern as the simplest equipment, the first step was to permanently attach thereto models or patterns of the gates, feeders, etc., in order that these need not be the subject of separate operations. In the case of small parts this leads to the mounting of several patterns on one gate.

To avoid the labor of producing a parting by hand for each mold, match parts were introduced, which are merely a semipermanent duplicate of one half of the mold (generally the cope).

In the interests of greater stability plate patterns were developed, consisting of fairly thin flat plates, usually of aluminum with the patterns mounted on one or both sides together with the gates, etc. The plate being at least as large as the exterior of the flask separates the cope and drag by its own thickness. Each half of the mold being rammed up off its own side of the plate, the mold when closed corresponds in form to the parts mounted on the plate.

To do away with hand rapping the pattern to withdraw it from the mold air and electric vibrators often are attached. In some cases, especially for heavy work, the pattern is withdrawn, usually by a lever motion, without rapping, through a stripper plate. The stripper plate is mere-

ly a plate representing the parting of the mold having an opening exactly fitting the contour of the pattern at the parting. When drawing the pattern downward through this plate the latter supports the sand and prevents its following the pattern.



MATERIAL HANDLING CRANE WHICH OPERATES FROM INTERNAL COMBUSTION ENGINE

Unless the cope and drag are duplicates, two machines are requisite for each job as the construction is evidently such as to be applicable to one-half the mold only for each unit.

Extremely heavy work is frequently handled on a roll-over machine which is especially available for making the drag. After the drag is rammed up, necessarily parting downward, the machine facilitates turning it over to its proper position by sustaining and counter balancing most of the weight of the mold and pattern by springs. The pattern is sometimes withdrawn through a stripper plate and sometimes by letting the mold sink away from under the pattern by a suitable lever motion. The sand is compacted by hand ramming, by the use of hand or air operated squeezers, and by jolt ramming. The latter operation consists of mechanically repeatedly raising the mold and allowing it to come down on a solid support which uses the inertia of the sand itself for compressing it. On floor work pneumatic rammers sometimes are used.

Crawling Tread Crane Has Gas Engine Power

To fill the need for a full revolving tractor crane which can be operated independently of rails, the Industrial Works, Bay City, Mich., has developed a new crane which is built in two types. The larger type, which is shown in the accompanying illustration, has a capacity of 20,000 pounds at 12 feet radius and is equipped with continuous crawling tractor belts while the smaller type has a capacity of 18,000 pounds at 10 feet radius and is equipped with four wide gage tractor wheels. Both types are well adapted to foundry and plant use. Depending upon the nature of the work they are to do, the cranes are supplied with a hook and block, grab bucket, electric lifting magnet or excavating equipment as desired.

Operation is by means of an internal combustion engine which is always ready for use. It is not necessary to have a licensed engineer as an operator. Up to the capacity of the engine, any combination of swinging, hoisting or changing the radius is possible. Steering of the crawling tread crane is controlled by manipulation of the friction clutches and brakes which regulate the motion of each tractor belt. By means of these clutches and brakes either of the belts may be disconnected from the engine while the other continues at the same speed. This permits great flexibility in maneuvering. All control levers are conveniently located in the revolving upper works.

News of Societies

Past and Coming Meetings of National and Local Trade and Technical Organizations

A W. WILLMANN, secretary of the American Manufacturers Export association, has announced that many acceptances have been received from commercial attaches, trade advisers and special representatives from as many different countries who will participate in the twelfth annual convention of the association to be held at the Waldorf-Astoria, New York, Oct. 5 and 6. These trade ambassadors will be on hand fully equipped to answer any questions which may be put to them by delegates to the convention.

* * *

Will Discuss Industrial Relations

The annual convention of the Industrial Relations Association of America will be held at the Waldorf Astoria hotel, Nov. 1 to 4. This organization is the outgrowth of the National Association of Employment Managers formed in Rochester, N. Y., in 1918. On the last day a joint sesion will held with the Academy of Political Science to discuss industrial relations.

Convention Calendar

Sept. 6-10—American Chemical society, the Society of Chemical Industry and the American section of the latter organization will hold a joint meeting in New York. Charles L. Parsons, P. O. Box 1505, Washington, is secretary of the first mentioned society.

Sept. 12—National Exposition of Chemical Industries, in the Eighth Coast Artillery armory, New York.

Sept. 12-17—American Institute of Mining and Metallurgical Engineers, will hold its fall meeting at Wilkes-Barre, Pa. Frederick F. Sharpless, 29 West Thirty-ninth street, New York, is secretary.

Sept. 14-16—National Association of Cost Accountants, will hold its annual convention at the Cleveland hotel, Cleveland. The secretary's address is 233 Woolworth building, New York.

Sept. 19-24—American Society for Steel Treating. Annual convention and exhibition at the Manufacturers building, state fair grounds, Indianapolis. W. H. Eisenman, 4600 Prospect avenue, Cleveland, is secretary.

Sept. 29-Oct. 1—American Electrochemical society, fall meeting, Lake Placid, N. Y. Joseph W. Richards, Lehigh university, S. Bethlehem, Pa., is secretary.

Oct. 5-7—Society of Industrial Engineers will hold fall meeting at Springfield, Mass.

Oct. 10-13—National Association of Purchasing Agents will hold its annual convention at the Claypool hotel, Indianapolis. L. F. Boffey, 19 Park place, New York, is secretary.

Oct. 17-22—American Mining Congress, will hold its twenty-fourth annual convention in the Coliseum, Chicago. Also national exposition of mines and mining equipment.

Oct. 17-22—National Hardware Association of the United States will hold twenty-seventh annual convention at the Marlborough-Blenheim hotel, Atlantic City. T. James Fernley, 120-24 High street, Boston, is secretary.

Offers New Scrap Classification

American Railway Association Committee Formulates Schedule for Action at Next General Meeting—Consumers Participate in Draft—Railway Storekeepers' List Followed in Many Points

CHICAGO, Aug. 23.—Following previous steps to standardize the classification of iron and steel scrap to minimize friction and remove most causes for controversy over grading, the scrap iron classification committee of the American Railway association is engaged in formulating a new classification to be acted on at its next general meeting.

Until the government took over the railroads the Railway Storekeepers' association had a classification which was widely used, though some roads had their own schedules of grading. Under the railroad administration another classification was put in effect, but since the roads have been in the hands of their owners some have gone back to the former schedule. The present effort is directed to standardizing all scrap offered by railroads. As this is the largest single source of this material a uniform classification will do much to cause other producers in self defense to adopt the same plan.

Consumers have been consulted in making up the present draft and many points where opinions differed have been smoothed out. Some further changes of a minor nature probably will be made. The new classification follows the storekeepers' plan in many points and is an effort to present an improvement on all previous plans, taking into account the requirements of all interests involved.

One point still at issue is the specification for No. 1 steel rail which rerollers believe should require that all rail offered under that head should be of rerolling grade. The railroad administration required this but it has not been incorporated in the present draft. The claim is made that inasmuch as rerollers are the only users of No. 1 steel rail, this restriction should be made.

Charles H. Hoinville, an official of the Atchison, Topeka & Santa Fe railroad, Railway Exchange building, Chicago, is chairman of the American Railway association's committee on scrap iron classification and is in charge of the new specifications. The proposed classification as now formulated is as follows:

1—Arch bars and transoms, iron.

2—Arch bars and transoms, steel.

3—Axles, steel, car and locomotive, 6 inches diameter and over at center.

4—Axles, steel, car and locomotive, under 6 inches diameter at the center.

5—Axles, steel, hollow bored.

6—Axles, iron, car and locomotive, all sizes.

7—Angle and splice bars, steel.

8—Angle and splice bars, patented joints only.

9—Angle bars, splices and fish plates, iron.

10—Boilers, fire boxes and tanks, uncut, all kinds, attached or separate. Specify whether with or without flues.

11—Boilers, fireboxes and tanks, cut up, iron or steel boiler or tank plate cut into sheets and rings, with or without staybolts.

12—Brake beams, uncut.

13—Built up bolsters.

14—No. 1 busheling, iron and soft steel pipes and flues (free from scales); tank and bands, No. 12 and heavier, boiler plate, punchings and clippings and soft steel and iron drop forgings and trimmings, nothing to be over 8 inches long or wide, free from galvanized or tinned stock.

15—Cast, railroad No. 1. Pieces weighing 150 pounds or less. Includes new grates, new stove plate and clean cast iron culvert, soil and water pipe, to be free from brake shoes and burnt grates, burnt grate frames, burnt stove plate and all other burnt castings.

16—Cast, railroad No. 2. Pieces weighing over 150 pounds, but not more than 500 pounds, otherwise same specifications as No. 15.

17—Cast, railroad No. 3. Pieces weighing over 500 pounds, including cylinders and driving wheel centers and all other castings, otherwise same specifications as No. 15.

18—Cast, railroad No. 4, all kinds of burnt castings, including grate bars, grate frames and stove plate.

19—Cast iron brake shoes, all shoes with steel back or with steel or wrought iron inserts, both driving and car. Excludes composition filled shoes.

20—Cast iron borings, clean and free from other metals, dirt and lumps.

21—Cast steel No. 1, charging box size, 5 feet and under, under 18 inches wide, no piece weighing less than 10 pounds to be included.

22—Cast steel No. 2, steel castings over 18 inches wide and over 5 feet long, may include cast steel truck or body bolsters and cast steel locomotive frames.

23—Cast steel truck and body bolsters.

24—Couplers and knuckles, steel, and steel knuckle locks.

25—Tools and tool steel, worn out steel tools, tool steel, files, including old claw bars, pinch bars, spike mauls, track wrenches, picks, axes, adzes, chisels, drills, hammers, knuckle pins, punches, finger pins, bits, draft keys, bar steel, weighing under 10 pounds per piece.

26—Frogs and switches, uncut, steel and iron frogs and switches that have not been cut apart, exclusive of manganese material.

27—Flues, tubes and pipes, wrought iron and steel, No. 1. One inch diameter and over, two inches long and over, free from fittings, paint, galvanized, or enameled, coiled or bent material.

28—Flues, tubes and pipes, wrought iron and steel, No. 2, ungraded wrought iron and steel flues, tubes and pipe, including fittings attached.

29—Limed iron and steel, all kinds of material from interior of boilers (except flues incrusted with lime or corroded by action of water), such as crown bars, crown bar bolts, stay bolts, etc.

30—Malleable, all malleable castings.

31—Melting steel, heavy, No. 1, charging box size, ¼-inch thick and over and not over 18 inches wide, or over 5 feet long, free from all attachments; may include chain, carbon tool steel, files, punchings and all other steel scrap that come within the above dimensions, unless otherwise specified.

32—Melting steel, heavy, No. 2, all steel over 5 feet long or over 18 inches wide.

33—Rail, iron, No. 1, Iron tee rail, 3 feet long or over, tee section 40 pounds per yard or over, free from frog, switch, guard or crooked rail.

34—Rail, iron, miscellaneous. All iron rail not otherwise specified, including guard rails, switch points and frogs when cut apart. Does not include frog fillers or plates.

35—Rail, steel, No. 1, standard section steel tee rails, 50 pounds per yard and over, 5 feet long and over, free from badly bent and twisted rails, frog, switch and guard rails and rails with split heads and broken flanges. NOTE—All rail suitable for relaying must be classified as relaying rail separate from all scrap rail.

36—Rail, steel, No. 2, cropped rail ends under 3 feet long, 50 pounds and over, standard section.

37—Rail, steel, No. 3, 3 feet long and over, 50 pounds and over, standard section, having split heads or ball of rail worn by wheel flanges, curved and bent rails, free from frog, switch and guard rails.

38—Rail, steel, No. 4, all sections of rail not coming under specifications of Nos. 1, 2 or 3 rail, including frog, cut apart, guard rails and switch points. Does not include frog fillers or plates.

39—Structural wrought iron, cut apart, wrought iron, structurals and shapes from bridges, buildings and equipment, cut apart and free from riveted material.

40—Structural wrought iron, uncut, wrought iron from bridges, structure and equipment which has not been cut apart.

41—Structural steel, uncut, all steel or steel mixed with iron from bridges, structures and equipment that has not been cut apart; may include uncut bolsters, brake beams, steel trucks, underframes, channel bars, steel bridge plates, frog and crossing plates and

other steel of similar character not included in No. 2 heavy melting steel, class 32.

42—Sheet scrap No. 1, under ¼-inch thick, consisting of cut stacks and stack netting, hoops, band iron and steel, pressed steel handcar wheels, scoops and shovels free from wood, and wire rope; must be free from galvanized iron or tin, cushion and other similar springs and lime encrusted pipe and flues from boilers.

43—Sheet scrap, No. 2 and miscellaneous, includes netting, other than stack wire, all galvanized or tinned material, composition brake shoes and gas retorts and any other iron and steel material not otherwise classified.

44—Spring steel No. 1, flat spring steel, including elliptic springs from which bands have been removed.

45—Spring steel, No. 2, all coil springs made from steel 3/16-inch and over.

46—Manganese steel, includes all kinds of manganese rail, frogs and switch points, cut or uncut.

47—Steel, high speed, high speed steel turnings (butts and ends report separately).

48—Tires, No. 1, all locomotive or car tires 36 inches and over inside diameter, smooth inside, not grooved for retaining rings or lipped.

49—Tires, No. 2, all tires not included in tires No. 1.

50—Turnings and drillings, No. 1, wrought iron and soft steel, clean, free from cast borings, brass, hard steel or other foreign metals, dirt and lumps.

51—Turnings and drillings, No. 2, from tires and other similar steel, including hard steel, clean, free from other metals, dirt and lumps.

52—Turnings and drillings, mixed, No. 1, wrought, cast and steel, mixed, free from other metals, dirt and lumps.

53—Turnings and drillings, mixed, No. 2, wrought, cast and steel mixed with brass and other metals, free from dirt and lumps.

54—Wheels, No. 1, includes all solid cast iron car and locomotive wheels. No allowance for grease and dirt.

55—Wheels, No. 2, includes all kinds of built-up or steel-tired wheels. (Specify kind in offering.)

56—Wheels, No. 3, includes all solid rolled, forged or cast steel car and locomotive shells. (Specify kind in offering.)

57—Wrought railroad No. 1, clean wrought, pieces 6 inches long and over, plate to be ¼-inch thick and over, rounds or squares ⅜-inch thick and over, to include bars, rods, chain, all to be free from riveted material.

58—Wrought, railroad No. 2, all wrought under 6 inches long not specified under No. 1 railroad wrought, to include track spikes, bolts, nuts, rivets and lag screws.

59—Wrought iron locomotive frames or mud rings, includes all other large wrought iron forgings.

60—Destroyed steel cars and locomotive tenders, includes underframes and bodies of cars cut apart sufficiently to load, excludes trucks and cast steel underframes.

Fire practically destroyed the Ford Motor Co. plant at Issy-les Moulincaux, suburb of Paris, at estimated loss of 6,000,000 to 7,000,000 francs.

Refractory Needs

Continue Small and On a Spot Basis—Some Prices Changed

Pittsburgh, Aug. 23.—Little improvement in the demand for refractories is noted. Purchases generally are for emergency purposes and when an order is placed, overnight shipments are desired. Stock brick at steelworks for relining purposes is low and new requirements are slow in developing. The product arriving at consuming points is for immediate use and rarely is the product purchased for stocking purposes. While frequently reports are heard of shading the $33 price on Pennsylvania silica brick, the transaction generally is found to have little bearing marketwise. In this connection a fairly large shipment was made recently from a Pennsylvania kiln at around $32 but investigation disclosed that the producer was desirous of reducing his stock owing to an indefinite shutdown and as an incentive offered his product at a concession. The price on this quality, however, still is ranging between $33 and $35 per 1000, f.o.b. works. The largest order heard recently included 400,000 bricks at $33.

Reports from some circles are that a little business may be expected in a few weeks from steel plant interests in the Mahoning valley. Magnesite brick is $5 off and now is quoted at $65 per net ton. The demand for this quality still is light. The price of chrome brick also is lower by $3 a net ton, the usual quotation being $52. Some producers of refractories report a slight improvement while others state they have witnessed no change. Generally, however, the market for all grades is dull and little encouragement is held for attractive business until steel plant operation again goes forward.

Fire Clay Brick

(Per 1000 f.o.b. works)

Pennsylvania, No. 1	$34.00 to 43.00
Pennsylvania, No. 2	28.00 to 32.00
Ohio, No. 1	34.00 to 36.00
Ohio, No. 2	28.00 to 32.00
Illinois, No. 1	35.00 to 40.00
Illinois, No. 2	30.00 to 35.00
Kentucky, No. 1	34.00 to 36.00
Missouri, high grade	42.00 to 44.00
Missouri, No. 1	33.00 to 36.00
Maryland, No. 1	37.00 to 50.00
Maryland, No. 2	31.00 to 35.00

SILICA BRICK

Pennsylvania	$33.00 to 35.00
Chicago	38.00 to 40.00
Birmingham	46.00 to 50.00

MAGNESITE BRICK
(Per Net Ton)

9 x 4½ x 2½	$65.00

CHROME BRICK
(Per Net Ton)

9 x 4½ x 2½	$52.00

BAUXITE BRICK
(Per Net Ton)

9" straights, 55 per cent	$50.00
9" series shapes, 55 per cent	55.00
9" straights, 76 per cent	90.00
9" series shapes, 76 per cent	95.00

Ore Washer Patent Suit Lost by McDougall

Duluth, Aug. 22.—Capt. Alex McDougall, inventor and shipbuilder, has lost his suit against the Oliver Iron Mining Co. in which he sought to recover royalties amounting to more than $19,000,000 claimed to be due him for infringements on a patent ore washer.

Judge Wilbur Booth, of the federal court here, rendered a decision against McDougall, absolving the defendant company from any liability on the ground that no device can be held to infringe a combination of claims such as the plaintiff possessed unless it employs all the elements of such claims.

Suit was entered originally two years ago. Captain McDougall expects to appeal the case to the circuit court of appeals or directly to the Supreme Court.

Name Commerce Bureau Division Chief

The appointment of R. A. Lundquist an electrical engineer of Minneapolis, Minn., to take charge of the newly created electrical machinery division in the bureau of foreign and domestic commerce has been announced by the department of commerce. This is one of the new industrial divisions made possible by congress through the export industries act. It is planned to secure the service of experts to specialize on the more important export commodities. Appointments in the iron and steel, lumber and heavy machinery divisions have already been announced. Lundquist has made extensive studies of possibilities for the sale of American electrical goods and machinery in Australia, New Zealand, China, Japan, and South Africa, the results of which were published by the bureau of foreign and domestic commerce.

The Stewart-Warner Speedometer Corp. for the quarter ended June 30, 1921, reports operating profit before Federal taxes of $601,945, as compared with $740,843 a year ago; and for the half year $652,892, against $1,470,147 in the corresponding period of 1920. For the half year, company has charged to surplus $440,000 for inventory.

Pig Iron Output First Half of 1921

Compiled by the American Iron and Steel Institute

HALF-YEARLY PRODUCTION OF ALL KINDS OF PIG IRON.

States.	Blast furnaces. In blast Dec. 31 1920.	June 30, 1921. In.	Out.	Total	Production—Gross tons. (Includes spiegeleisen, ferro-mang., ferro-silicon, ferro-phosphorus, etc.) First half of 1920.	Second half of 1920.	First half of 1921.
Maine	0	0	0	0			
Massachusetts	1	0	1	1	6,180	4,101	1,537
Connecticut	0	0	2	2			
New York	16	3	24	27	1,207,475	1,393 659	506,113
New Jersey	1	1	3	4			
Pennsylvania	73	27	134	161	7 241,726	6,741,408	3,577,570
Maryland	2	1	6	7	254,420	269,313	75,130
Virginia	4	2	15	17	223,522	205,780	53,519
Alabama	15	8	35	43	1,225,236	1,167,726	659,225
Georgia	0	0	4	4			
Texas	0	0	1	1			
West Virginia	3	1	4	5	374,906	397,473	117,215
Kentucky	0	0	7	7			
Mississippi	0	0	1	1			
Tennessee	3	0	17	17	159,041	124,166	12,369
Ohio	49	14	66	80	4,130,811	4,402,659	2,081,847
Illinois	16	6	20	26	1,634,164	1,646,711	1,030,801
Indiana	12	7	9	16	1,426,045	1,513 476	1,019 010
Michigan	10	2	11	13			
Wisconsin	3	1	6	7			
Minnesota	2	0	3	3	345,091	366,314	211,574
Missouri	3	1	3	4			
Iowa	0	0	0	0			
Montana	0	0	0	0			
Colorado	3	2	3	5	206,985	257,599	185,071
Oregon	0	0	1	1			
Washington	0	0	0	0			
Total	216	76	376	452	18,435,602	18,490,385	9,530,981

HALF-YEARLY PRODUCTION OF COKE PIG IRON.*

Maine	0	0	0	0			
New York	16	3	23	26	1,211,475	1,393,650	507,108
New Jersey	1	1	3	4			
Pennsylvania	71	27	120	147	7,094,917	6,585,086	3,564,406
Maryland	2	1	5	6	254,420	269,313	75,130
Virginia	4	2	15	17			
Georgia	0	0	2	2	223,522	205,780	53,519
Texas	0	0	1	1			
Alabama	14	8	32	40	1,212,718	1,154,404	655,693
West Virginia	3	1	4	5	374,906	397,473	117,215
Kentucky	0	0	7	7			
Tennessee	3	0	14	14	155,897	115,104	12,369
Ohio	49	14	66	80	4,130,811	4,402,659	2,081,847
Illinois	16	6	20	26	1,634,164	1,646,711	1,030,801
Indiana	12	7	9	16			
Michigan	2	1	3	4	1,502,165	1,558,526	1,060,523
Wisconsin	2	1	5	6			
Minnesota	2	0	3	3			
Missouri	1	0	1	1			
Iowa	0	0	0	0			
Montana	0	0	0	0	338,616	437,698	289,612
Colorado	3	2	3	5			
Washington	0	0	0	0			
Oregon	0	0	1	1			
Total	201	74	337	411	18,133,611	18,166,413	9,448,223

*Includes ferro-alloys made with electricity, electricity and coke, etc.

HALF-YEARLY PRODUCTION OF ANTHRACITE AND MIXED ANTHRACITE AND COKE PIG IRON.

Pennsylvania	2	0	10	10	146,379	156,188	12,823
Total	2	0	10	10	146,379	156,188	12,823

HALF-YEARLY PRODUCTION OF CHARCOAL PIG IRON.

Massachusetts	1	0	1	1			
Connecticut	0	0	2	2	2,610	4,235	883
New York	0	0	1	1			
Pennsylvania	0	0	4	4			
Maryland	0	0	1	1			
Alabama	1	0	3	3			
Georgia	0	0	2	2	15,662	22,384	3,532
Tennessee	0	0	3	3			
Mississippi	0	0	1	1			
Michigan	8	1	8	9	92,382	113,141	41,346
Wisconsin	1	0	1	1			
Missouri	2	1	2	3	44,958	28,024	24,174
Total	13	2	29	31	155,612	167,784	69,935

TOTAL PRODUCTION OF PIG IRON ACCORDING TO FUEL USED.

Coke*	201	74	337	411	18,133,611	18,166,413	9,448,223
Anthracite†	2	0	10	10	146,379	156,188	12,823
Charcoal	13	2	29	31	155,612	167,784	69,935
Total	216	76	376	452	18,435,602	18,490,385	9,530,981

* Includes ferro-alloys made with electricity, electricity and coke, etc.
† Includes mixed anthracite and coke pig iron.

HALF-YEARLY PRODUCTION OF BASIC PIG IRON.

States.	First half of 1920.	Second half of 1920.	First half of 1921.
New York, New Jersey	513,327	623,977	199,568
Pennsylvania—Allegheny County	1,646,540	1,498,938	1,024,302
Other counties	2,180,007	1,970,770	736,305
West Virginia, Alabama, Kentucky	691,574	707,124	438,730
Ohio	1,442,867	1,505,444	685,788
Indiana, Illinois	1,754,977	1,699,669	1,149,432
Michigan, Minnesota, Missouri, Colorado	221,402	281,106	270,306
Total	8,450,694	8,287,028	4,504,431

HALF-YEARLY PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON.

New York	193,096	181,992	61,225
Pennsylvania	2,523,457	2,432,309	1,381,591
Maryland	247,070	274,663	74,660
West Virginia, Kentucky, Tennessee, Alabama	193,426	218,097	73,816
Ohio	1,899,250	2,079,537	1,081,868
Illinois, Colorado	862,225	956,962	606,912
Total	5,918,524	6,143,560	*3,280,072

* Includes 62,908 tons of low-phosphorus pig iron.

HALF-YEARLY PRODUCTION OF FOUNDRY PIG IRON AND FERRO-SILICON.

Maine, Massachusetts, Connecticut	6,173	4,062	1,537
New York, New Jersey	398,765	456,003	215,512
Pennsylvania	539,707	531,637	285,798
Maryland, Virginia, West Virginia	236,597	200,405	67,138
Kentucky	42,601	29,378	
Tennessee	136,692	103,942	
Alabama	644,494	582,360	241,091
Ohio	488,448	528,463	219,004
Indiana, Illinois	107,572	83,876	104,944
Michigan	170,099	249,587	118,110
Wisconsin	171,416	163,736	83,800
Missouri, Iowa, Colorado, Washington	37,637	44,102	36,465
Total	2,980,201	2,977,581	*1,375,399

* Includes 55,180 tons of ferro-silicon.

HALF-YEARLY PRODUCTION OF MALLEABLE PIG IRON.

New York	90,320	114,168	22,533
Pennsylvania	68,880	40,820	14,099
Kentucky, Ohio	245,221	210,993	62,267
Indiana, Illinois, Michigan, Wisconsin, Minn.	261,744	278,805	66,623
Total	666,165	644,786	165,522

HALF-YEARLY PRODUCTION OF FORGE PIG IRON.

New Jersey, Pennsylvania	104,818	70,985	13,280
Virginia, Tennessee	2,366	710	.....
Alabama	9,441	8,258	5,276
Ohio	52,244	69,226	30,381
Total	168,869	149,179	48,937

HALF-YEARLY PRODUCTION OF SPIEGELEISEN AND FERRO-MANGANESE.

New York, Pennsylvania	170,706	191,670	122,093
Virginia, Alabama, Tennessee	4,287	12,602	9,646
Illinois, Colorado, Montana, Washington	11,968	15,663	4,530
Total	186,961	219,935	*136,269

* Includes 83,861 tons of ferro-manganese and 52,408 tons of spiegeleisen.

HALF-YEARLY PRODUCTION OF OTHER GRADES.

Connecticut, New York, New Jersey	7,984	8,478	4,482
Pennsylvania	11,601	13,329	2,895
Maryland, Va., West Va., Ky., Tenn., Alabama	21,587	26,923	7,101
Ohio	9,771	8,992	2,539
Indiana, Illinois, Michigan, Wisconsin, Missouri, Colorado	13,245	10,594	3,334
Total	64,188	68,316	20,351

PIG IRON MADE FOR SALE OR FOR USE OF MAKERS IN THE FIRST HALF OF 1921.

Grades.	For sale.	For maker's use.	Total. Gross tons.
Basic	361,884	4,142,547	4,504,431
Bessemer and low-phosphorus	263,964	3,016,108	3,280,072
Foundry, including ferro-silicon	1,211,014	164,385	1,375,399
Malleable	132,673	32,849	165,522
Forge or mill	20,291	28,646	48,937
Ferro-manganese	22,797	61,064	83,861
Spiegeleisen	5,745	46,663	52,408
All other grades	10,314	10,037	20,351
Total	2,028,682	7,502,299	9,530,981

New Rate Affects 500,000 Tons from Valleys

Youngstown, O., Aug. 23.—A freight reduction of approximately $2.10 a net ton on iron and steel products for export through Atlantic ports has been assured producers in this territory as a result of an agreement to a 25 per cent rate cut between the manufacturers and railroads at a meeting last week in New York. The present iron and steel rate to seaboard is 42 cents per hundred. The new rate will be approximately 31½ cents.

The rate reduction extends as far west as Chicago and so benefits iron and steel makers in the export trade in all territory between that city and eastern tidewater. It will be necessary for the interstate commerce commission to approve the cut as stated in traffic quarters this is a mere formality and the new rate may be effective as early as Sept. 1. Assuming 10 per cent of the iron and steel production goes to the export trade from this territory approximately 500,000 tons annually will be affected by the lower rate. This will save about $1,000,000 a year.

Pig Iron Production

ON THE opposite page is given in detail the production of all grades of pig iron in the United States for the first half of 1921, as compiled by the American Iron and Steel institute. The output is totaled by grade of iron and by states, and compared with the first and last half productions of 1920. A further classification shows the tonnages of merchant and non-merchant iron. These figures were summarized on Page 410 of the Aug. 18 issue of THE IRON TRADE REVIEW.

The Yale & Towne Mfg. Co. announce a 10 to 15 per cent cut in piece and hourly wage rates, affecting 2300 employes, and an increase in working schedule from 27 to 45 hours a week.

Japan Buys

Sulphate Ammonia in Sizable Quantities—Production at 25 Per Cent

New York, Aug. 23.—Fair-sized quantities of sulphate of ammonia for shipment through the remainder of this month, September and October, are now being purchased by Japan at around $2, eastern seaboard. A slight improvement is also noted in domestic demand, although with the fertilizer interests, in most cases still heavily stocked, this business is far from large.

Production of coal tar distillates is now around 25 per cent of capacity. At this low rate, demand is proving sufficient to absorb supplies. This is true at the present time, not only of benzol, but toluol and solvent naphtha. The dye industry and the paint and varnish manufacturers continue the most active among consumers. Demand is for nearby shipment.

Quotations remain steady at the following levels: Pure benzol 27 cents, producers' plants, in tanks and 31 to 35 cents, in drums; 90 per cent, 25 cents in tanks and 28 to 31 cents, in drums; toluol, 28 cents in tanks and 31 to 34 cents in drums; solvent naphtha, 25 cents in tanks and 28 to 31 cents, in drums. Phenol is being quoted at 15 to 17 cents, producers' plants.

Demand for motor fuel is being well maintained both here and abroad, production being readily absorbed.

Coke Oven By-Products

Spot

Per Gallon at Producers' Plants

Pure benzol	$0.27 to .33
Toluol	.28 to .34
Solvent naphtha	.25 to .31

Per Pound at Producers' Plants

Phenol	$0.15 to 0.17
Naphthalene, flake	$0.075 to $0.085
Naphthalene, balls	$0.085 to $0.095

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	$2.00

Contract

Pure benzol	$0.27 to .33
Toluol	.28 to .34
Solvent naphtha	.25 to .31

Per Pound at Producers' Plants

Phenol	nominal
Naphthalene, flake	nominal
Naphthalene, balls	nominal

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	nominal

The capital stock of the Standard Steel Corp., Milwaukee, has been increased from $300,000 to $750,000. The new stock consists of $150,000 preferred and $600,000 common. The company manufactures steel farm equipment and recently erected and equipped a new plant at 1251-1261 Thirtieth street.

Obituaries

O. E. ANTHONY, traffic manager for M. A. Hanna & Co., Cleveland died Aug. 20 from a fractured skull received in an automobile accident in Lakewood, O., earlier in the day. Mr. Anthony had been traffic manager for the company for the past five years. Previously he had been on the staff of the general freight agent of the New York Central railroad with headquarters in Cleveland.

Wallace D. Glidden, assistant treasurer of the Kewanee Boiler Co., Kewanee, Ill., died suddenly from heart trouble while on his vacation at a camp near Boulder Junction, Wis.

James Henry Tower, president and director of the James H. Tower Iron Works, Providence, R. I., died at his home in Wakefield, R. I., Aug. 13, after a long illness. He was 75 years old. Mr. Tower for many years had been connected with the business which was established in 1835 and incorporated in 1914.

James B. Stone, for many years superintendent of the rope mill of the former Wright Wire Co., Palmer, Mass., now the Palmer works of the Wickwire Spencer Steel Corp., died at his home in Berkeley, Cal., Aug. 9. After his retirement from the Wright Wire Co., several years ago, Mr. Stone moved to California.

Thomas W. Holmes, superintendent of the Twenty-fifth street plant of the American Railway Steel Spring Co., Pittsburgh, died in Erie, Pa., Aug. 11, after a short illness of pneumonia. He was 27 years old.

Frank Miller, treasurer of the Lake Torpedo Boat Co. of Maine, Bridgeport, Conn., died at his home in that city, Aug. 13, aged 73 years. Mr. Miller was a financial leader of Bridgeport, a former president of the City National bank, founder of the Frank Miller Lumber Co., and president of the Citizens Coal Co., Waterbury, Conn.

Charles W. Griffin, heating engineer and superintendent of the J. B. Farnsworth Co., Leominster, Mass., steam fitter, died unexpectedly at Asquam Lake, N. H., Aug. 13, while on a visit to his son, who was camping there. He was 67 years old and had been connected with the Farnsworth Co. for 30 years, being widely known throughout New England as a heating expert.

Autumn Activity Is Foreshadowed

Next Few Weeks Will Bring Definite Assurance of Permanency of Improvement in Business—Better Sales at Higher Prices Show Start Has Been Made—Caution Still Prevails—Financial News

BY JOHN W. HILL, FINANCIAL EDITOR

TRADE developments within the next few weeks will demonstrate whether or not the recent expansion in activities is to grow into a permanent seasonal enlargement of autumn business. Already strong indications have appeared that the current improvement is something more than a temporary affair. As one leading commercial agency expresses it "in such lines as silk goods, shoes, canned goods, raw wool and iron and steel, the movement had progressed beyond the point of mere feeling and has found expression in larger sales at higher prices." Better prices for pig iron and scrap material are especially significant.

Nowhere has the expansion been pronounced, however, and caution in buying continues in every line. This caution is more influenced by inability to judge the probable consumer demand than by price uncertainty, because some degree of price stability has begun to appear. The fact that "immediate need" buying has caused an improvement in the volume of business moving is in itself a constructive factor. It confirms the view that commodity stocks are low, due to curtailed production and the steady absorption occasioned by the minimum requirements of 107,000,000 people of the country.

With low stocks in the iron and steel industry as well as in other lines, with fair farm prospects, with decidedly easier money conditions, and with prices, wages and production costs well liquidated in many cases, it would seem that business has a substantial foundation upon which to build a gradual recovery.

The advance last week of the federal reserve ratio to 65.8 per cent, compared with 65 per cent the preceding week, and 43.5 per cent one year ago, measures the improvement in the financial situation. Lower loan rates are appearing and business should be able to finance the autumn trade with comparative ease and cheapness although normal credit conditions are not expected immediately. This in itself should prove stimulating.

Leveling Process Is Applied

The factor of uneven price deflation and its sinister effect upon the business situation have frequently been referred to in these columns. Disturbance of the old price relationship between groups of commodities has been one of the most serious phases of the late depression, because it has depleted the purchasing power of such an important group of consumers as the farmers. Recent price movements indicate that a leveling process is being applied to the glaring inequalities of the price structure.

The evidence of greater stability provided by both Dun's and Bradstreet's wholesale price indices for Aug. 1, is corroborated by the similar index compiled by the government's bureau of labor statistics. This shows that in July the average of wholesale prices was unchanged from June. The movements affecting the various items composing the index show how the economic remedy is working, however. Food prices increased while other goods such as building materials, house furnishings and chemicals, declined materially.

The index reveals also how much further the leveling process must go before a parity is reached. The average of all prices is 48 per cent above 1913, but farm products are only 15 per cent above. Building materials, are still 100 per cent in excess of the prewar level, fuel and light 84 per cent, house furnishings 135 per cent, and chemicals 63 per, cent. Metals and metal products are but 25 per cent above 1913. Thus it would seem that farm and metal products are near a parity, while other classes of commodities are still out of line. The adjustment may be expected to continue until a common level is reached for all goods.

The need for bringing the prices of industrial products within the range of the buying ability of farmers is now generally recognized. The recent announcements of widespread reductions in farm tool and implement prices show the trend. City industrial workers' wages have not been reduced proportionately with the reduction in returns to farmers. As a result, industrial unemployment is far reaching. However, gradual but steady deflation of production costs in manufacturing will help remedy the situation. For this reason, the recent announcement of another wage reduction by the United States Steel Corp. is a constructive development. The stern era of competition ahead in all industries will compel rock bottom production costs and prices. Narrow profit margins will be compensated by more rapid turnover for those companies which are prepared.

Confidence Is Expressed

In a forecast of business activities for September, Moody's Investor's Service expresses confidence that business is slowly but definitely improving. This will become generally recognized by next month, it says. The September forecast reads:

"Commodity prices ought generally to continue the upward movement already begun, although of course, there may be exceptions in the case of some farm products which are marketed in extra heavy volume at this season. Such a rise is definitely foreshadowed by the commencement of new buying of raw materials and by the smallness of crops. Unemployment of labor should diminish perceptibly, notwithstanding the fact that it has been increasing since June or May. New orders are beginning to come forward and traffic is expanding.

"Exports in September should expand in consequence of the outward movement of farm products. Imports ought also to improve as Europe pays for these exports with goods. In foreign exchange the general tendency should be downward.

"Commercial failures should tend to diminish as compared with recent months and this holds true despite the fact that September normally, shows an increase. Trading concerns are well deflated, and manufacturers would be helped by the moderate amount of new business appearing. General business, according to our trade barometer, should expand and the retail distribution of goods should improve. Moderate gains may be expected even in automobiles. October should show a continuation of September trends and conditions should show more pronounced improvement."

Charcoal Iron Reports June Quarter Loss

The Charcoal Iron Co., of America, Detroit, reports a loss of $180,332 during the second quarter of 1921, compared with a loss of $86,845 in the preceding three months. In the last quarter of 1920 the company lost $157,264 making a total deficit of $424,941 from nine months operations. During the first nine months of 1920 total net profits amounted to $1,202,828.

The severity of the slump in its effect upon the company is shown in the report for the June quarter. The production of pig iron during the three months was only 437 tons compared with 14,474 tons in the March period and a quarterly average during 1920 of 23,364 tons. There were 21,212 gallons of alcohol produced against 234,022 gallons in the preceding quarter and an average of 382,379 in 1920. The output of ore totaled 17,730 tons. In the June quarter it was 54,167 and the average last year was 87,001.

A more cheerful phase of the report, however, is that which shows shipments in the last quarter exceeded production. This is the reverse of the first three months when output was in excess of shipments in most important items. The company in the June quarter shipped nearly 3000 tons more pig iron than was made and 80,000 gallons more alcohol. In the full year 1920, 93,456 tons of iron were produced and 75,459 tons shipped. More than 1,000,000 gallons of alcohol were made and less than 600,000 gallons shipped. Nearly 350,000 tons of ore was mined and 337,000 tons shipped.

At the end of 1920 the company had surplus of $1,852,175 and this has been reduced to $1,584,497. Current liabilities are given at $2,119,946. Current assets are $3,542,347, including inventories of $3,329,357. In his statement to stockholders, President Frank W. Blair, of the company, says:

"Although the company is possessed of a wealth of property and plentiful assets for a concern engaged in this line of business, it has been impossible during the last 10 months—a longer and more depressed business period than ever existed before in the history of the enterprise, to either manufacture or market its products and meet obligations promptly.

"Therefore in order to protect the interests of the stockholders, it has become necessary for the board of directors to give consideration to the advisability of a bond issue to furnish proper working capital until such time as the business situation throughout the country may have improved."

General Motors Earnings Make Gain

For the six months ended June 30, 1921, the General Motors Corp. surplus after charges, federal taxes, and preferred and debenture dividends, amounted to $6,468,551. This compares with a surplus of $32,504,664 in the corresponding period of 1920.

Inventories on June 30, 1921, amounted to $147,502,086, as compared with $222,098,805, the high point reached in October, 1920. This represents a reduction of $74,596,719, of which $25,776,112 was accomplished through writing down of inventories, as shown in the last annual report.

In connection with the semiannual statement Pierre S. du Pont, president of the corporation states that during the period of depression accounts payable, which had reached $40,736,127 under active business of 1920, have been reduced to $19,852,581, and notes payable that reached a maximum of $87,596,076, have been reduced to $68,808,250, a total reduction in these two items of $39,672,372. In addition purchase money notes on account of Fisher Body Corp., stock purchase have been reduced by $6,840,000, and $6,661,790 represents the increase of cash in bank.

Net earnings for the second quarter of 1921 shows a considerable increase over the first quarter, the figure for the latter period being $14,551,516, as against $3,707,944 for the former.

Canadian Locomotive Co. Issues Report

The Canadian Locomotive Co. for the year ended June 30, 1921, reports operating profits after taxes of $827,091, compared with $367,969 in the previous twelve months. The balance available for dividends, after interest and depreciation, was $605,291, against $109,189 in 1920. After allowing for the regular preferred dividends the surplus for the common stock was equal to about $25 a share on the $2,000,000 of common capital stock outstanding. In the year 1920 the company reported a deficit after dividends. The profit and loss surplus as of June 30, 1921, was $1,551,275.

New York Air Brake Co. Pays in Scrip

The directors of the New York Air Brake Co. declared a quarterly dividend of 1¼ per cent, payable in 6 per cent interest bearing scrip instead of cash. It had been generally expected that the directors would declare this dividend in view of their announcement made in the previous quarter, but the payment in scrip was received with surprise. The dividend is payable Sept. 20 to stockholders of record Sept. 1. The scrip matures on or before Sept. 1, 1922. In February of this year the company declared a quarterly dividend of 2½ per cent at the rate of 10 per cent per annum, which had been paid since the first quarter of 1919. In 1918 and 1917 20 per cent was paid. In May, however, when the directors met for action on the dividend for the second quarter of the year no declaration was made, and a statement was issued that the distribution of 2½ per cent declared in the first quarter of the year was to cover the first six months and the annual rate consequently would be reduced from 10 to 5 per cent.

Massillon Consolidation Goes Through

The merger of the Massillon Rolling Mills Co. and the National Pressed Steel Co. with the Central Steel Co. of Massillon has been approved unanimously by the stockholders of the first two companies in accordance with the terms agreed upon some time ago by the respective directorates.

The stockholders of the Central Steel Co. gave their approval also. According to officials of the three companies, 60 days will be required for the triple consolidation to be finally completed. The merger involves about $18,000,000 as represented by the capitalization of the three concerns.

Under terms of the agreement R. E. Bebb, president of the Central Steel Co. will be in executive charge of the merged interests. Some changes in personnel are probable in the grouping activities, according to indications Thursday.

Financial Crop Ends

THE plan to arrange an American loan to Germany of between $25,000,000 and $50,000,000 has failed owing to unwillingness of American bankers to extend a year's credit because of the uncertainties regarding the reparation and Upper Silesian questions, according to Berlin dispatches.

* * *

The Lavelle Foundry Co., Anderson, Ind., has increased the number of its directors from three to seven.

* * *

The treasury announces that holdings of war savings stamps average $6.40 per capita and total $676,520,000.

* * *

The American Locomotive Co. declared the regular quarterly dividends of 1½ per cent on the common stock and 1¾ per cent on the preferred.

* * *

Owing to continued quiet business conditions and large stock on hand, Smith & Wesson, Springfield, Mass., pistol manufacturers, have announced that their plant, which was closed July 15 for a month, would not reopen before Sept. 6.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

GEORGE W. HOCKING, secretary of the Wheeling Steel Corp., Wheeling, W. Va., since its organization a year ago, has tendered his resignation to the board of directors. Mr. Hocking has been connected with the Whitaker-Glessner Co., a subsidiary of the Wheeling Steel Corp. for upwards of 20 years, serving with that company as secretary until the organization of the Wheeling Steel Corp.

Joseph Volkommer of the Vitro Mfg. Co., Pittsburgh, left recently for South America on a business trip.

W. LaCoste Neilson, London, Eng., vice president and foreign manager of the Norton Co., Worcester, Mass., has sailed for a visit to the home office.

Philip C. Clifford, Portland, Me., has been appointed receiver for the Signal Motor Truck Co., having a factory in Detroit, which has been closed.

Walter G. Bunzel, formerly chief engineer of the Richmond Radiator Co., is now connected with the Pittsburgh Electric Furnace Co. at its New York office.

George McQuilkin, proprietor of the Enterprise Machine Works, Elkton, Md., which he established several years ago, has discontinued the business because of ill health.

Col. Arthur D. Butterfield, educational director of the Norton Co., Worcester, Mass., is a candidate for the republican nomination for the school committee in that city.

E. W. Seaholm has been appointed chief engineer of the Cadillac Motor Car Co., Detroit. During the war he was connected with the production of liberty motors.

James O. Perrine has resigned as a member of the faculty of Cornell university, Ithaca, N. Y., to became associated with the American Telephone & Telegraph Co. in an advisory capacity.

J. O. G. Gibbons, at one time with Westinghouse, Church, Kerr & Co., has joined C. E. Brown in a partnership of Gibbons & Brown, Ordway building, Newark, N. J., as engineers.

Harry C. Barnes, secretary of the Wallace Barnes Co., Bristol, Conn., maker of steel springs, is a republican candidate for mayor of that city in the primaries Sept. 20.

Vernon Cole, Barre, Mass., who graduated from the Massachusetts Institute of Technology, Boston, in June, has taken a position as mechanical test engineer with the Duquesne Light Co., Pittsburgh,

J. T. Kane who for many years was general superintendent in charge of shipping at the Trumbull Steel Co. Warren, O., now is warehouse superintendent for the Sheet Metal Mfg. Co., Youngstown, O.

Henry A. Palmer, formerly of the Palmer Machine Co., and Palmer & Upson, both of Westfield, Mass., has secured an interest in the Rice Gelatine Paper Co. of that city and will devote all his time to the business.

C. A. Ducharme, formerly with the Republic Iron & Steel Co., now is associated with J. Edward Grinfield-Coxwell, Boston, dealer in cold finished steel, forgings and supplies, as sales agent.

P. R. Mather, of Picands, Mather & Co., and H. P. Bole, vice president of the Hydraulic Pressed Steel Co., both of Cleveland, have been elected directors of the United Machine & Mfg. Co., Canton, O.

George Williams, who has been connected with Compagnie des Meules Norton, Paris, France, a subsidiary of the Norton Co., Worcester, Mass., has returned to this country and will join the home office forces again.

John P. Kelly, Pittsfield, Mass., inspector of safety appliances in the bureau of safety of the interstate commerce commission, has been promoted to the position of senior mechanical engineer for the bureau and will make his headquarters in Washington.

J. G. Esslinger, who for the past three years has represented Mayer & Lage, Inc., 120 Broadway, New York, importers and exporters, in the Far East, has resigned and returned to New York. At one time Mr. Esslinger was connected with the Philadelphia office and later the New York office of the Youngstown Sheet & Tube Co.

P. G. Dann, for the past four years with the engineering department of the Truscon Steel Co., Youngstown, O., has resigned to become manager of the New York office, 30 Church street, of the Hendrick Mfg. Co., Carbondale, Pa., manufacturer of perforated metal and general sheet and light structural iron work.

Walter F. Duffy, treasurer of the Acme Knitting Machine & Needle Co., Franklin, N. H., and his brother, George E. Duffy, president and treasurer of the George E. Duffy Mfg. Co., Worcester, Mass., have purchased the Ipswich Mills, Belmont, N. H., of the Ipswich Hosiery Co., Ipswich, Mass., and will reopen them Sept. 1.

C. T. Stewart of the Harbison-Walker Refractories Co., and R. T. Blair of the Pittsburgh Gage & Supply Co., Pittsburgh, have been chosen delegates by the Purchasing Agents' Association of Pittsburgh to the national convention of the Purchasing Agents' Association of the United States, to be held in Indianapolis, Oct. 13-15.

Edwin H. Marble, president of the Curtis & Marble Machine Co., Worcester, Mass., has returned from a 10 weeks' European trip during which he attended the world cotton conference, the first annual meeting of the International Chamber of Commerce in England, and the annual convention of the International Association of Rotary clubs in Edinburgh, Scotland.

Lawrence M. Keeler, agent for the Whitin Machine Works, Whitinsville, Mass., recently returned from a six months trip to the Orient. Frederick R. Pratt and John F. Holmes, who went with him, will remain to represent the company and to assist manufacturers there in developing their plants, organizing new mills and encouraging the manufacturers to further extend the textile industry in the Orient.

Jules Aubrun has been appointed director general of the Establishment Schneider et Cie, Le Creusot, France, to fill the vacancy caused by the accidental death recently of Achille Fournier. Mr. Aubrun is a member of the Mining Engineering association and until his recent promotion was chief of the department of mines and metallurgy of the Schneider establishment in Creusot.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

THE Post-Whitney Co., a consolidation of the Post Tractor Co., Cleveland, the Whitney Tractor Co., Upper Sandusky, O., and the Chief Motor Co., Port Huron, Mich., has perfected production plans, which call for the manufacture and sale of 30,000 tractors within the next 16 months. The officers of the company are: President and treasurer, A. B. Whitney; vice president and general manager, Harry S. Erd and secretary, Ralph Blue. Maurice F. McCarthy has charge of production and C. E. Grove is manager of distribution, which includes sales, service and advertising. The company will concentrate its manufacturing facilities in producing a one-man, 2-plow, 4-wheel tractor. The Post plant at Cleveland will be utilized for the building of transmissions, while the Chief Motor plant will be devoted to the exclusive manufacture of engines. Other tractor parts, etc., will be manufactured at the Upper Sandusky plant.

* * *

WITH a capital stock of $300,000, a Canadian branch of the Wallace Barnes Co., Bristol, Conn., to be known as the Wallace Barnes,Co. Ltd., will be established at Hamilton, Ont. Operations in the new Canadian plant of the company are expected to be started some time in September. Truman E. Norton, formerly of the home plant, is manager of the Canadian branch.

* * *

THE capital stock of the Columbus Foundry Co., Columbus, Ind., recently was increased from $15,000 to $35,000, the additional capital being made necessary by the increased business of the company. The force of employes has been increased from time to time until at present it is operating at almost a normal basis. Sufficient orders are on hand to keep the company running several months, it is said.

* * *

PRELIMINARY plans are being completed by the Hancock Steel Co., Martinsburg, W. Va., for the erection of the initial unit of its proposed plant at Hancock, Md. The building will be 1-story, 130 x 200 feet, and will be equipped for use as a machine shop and foundry. Ernest McGeorge, Cleveland, is engineer in charge of construction. F. Vernon Aken is president of the Hancock company.

* * *

PLANS are being made by the Staub Coal Co., Tracy City., Tenn., for the development of 110 acres of valuable coal lands located about 18 miles from Chattanooga, Tenn., on which it recently obtained a lease. The company has already taken possession of the property and it is estimated the contemplated development, which will include the sinking of a mine with a capacity of 500 tons a day, will involve an approximate expenditure of $75,000.

* * *

ADVICES have been received to the effect the Adria Motor Car Corp. has taken over the plant of the Gray Machine Tool Co., at Batavia, N. Y., and the building will be utilized for the manufacture of automobiles. It is said the Adria car will be designed along unique lines, insofar as the springs are concerned, the purpose of the special design being to take the load off the driving axle. Officers of the company are: President, Louis F. Vremsak; vice president, A. E. Fowler and secretary, Willard C. Wheeler.

* * *

ARRANGEMENTS have been perfected by the Reeves Pulley Co., Columbus, Ind., with Manning, Maxwell & Moore, Inc., 119 West Fortieth street, New York, whereby the latter organization will conduct the exclusive agency in the New York territory for the Reeves company's variable speed transmission. It is understood Manning, Maxwell & Moore will carry a complete assortment of repair parts. In addition to this line, they will carry a complete line of the Reeves company's wood split pulleys.

* * *

FURTHER expansion of the facilities of the United Machine & Mfg. Co., Canton, O., are said to be under consideration, as the result of the developing and acquisition of a number of new patents by the company. P. R. Mather, of the Pickands-Mather Co., Cleveland, and H. B. Bole, vice president of the Hydraulic Steel Co., Cleveland, recently were added to the directorate of the company, at a recent stockholders' meeting. These new directors will represent Cleveland capital which recently has become interested in the company.

* * *

FOUNDRY and machine shop equipment will be required by the Sommers Metal Products Co., Milwaukee, which has advised that it has had plans prepared for the erection of a plant building, 40 x 120 feet, which will house a foundry, machine and copper shops. It is estimated the structure will be built at a cost of $10,000. At present the company is operating under the name of the Sommers Sons Co., but the organization was recently incorporated under the former name with factory and offices at Thirty-first and Burleigh streets. The company manufactures milk condensing machinery, brass, aluminum and special alloy castings, as well as copper work of any size. Officers of the company are: President, C. J. Sommers; vice president, P. Seitz and secretary and treasurer, M. J. Sommers.

* * *

A NEW paper mill costing $800,000 will be built at Blair Springs, near Neenah, Wis., early next year by the Valley Paper Mills Co., recently incorporated by Milwaukee and Neenah, Wis., capital represented by George W. Burnside, who will be general manager. Plans are being prepared by Architect Edward A. Wettengel of Appleton, Wis., for a brick steel and reinforced concrete building, 80 x 555 feet, partly 2-story, to be divided as follows: Machine room, 80 x 170 feet; beater room, 80 x 100 feet; finishing room, 80 x 150 feet; power plant unit, 80 x 165 feet. The substructure will be started late this fall and the work completed by April 1. Two of the largest paper machines in the country will be installed, to be fed by eight beaters and washers. Albert C. Ehlman, 835 Caswell block, is attorney for the company and also in charge of chemical engineering design.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

THE Dodge Sales & Engineering Co., Mishawaka, Ind., has announced that excavation for its proposed $1,000,000 building in New York, at 49 Park place, is practically completed. The new structure will occupy 165 feet on West Broadway, 50 feet on Murray street and 75 feet on Park place. Present plans call for a structure of 12 stories, but foundations and construction will permit of an additional four stories. The new building will be located within convenient distance of subway and elevated stations. The basement of the building and part of the first three floors will be used by the Dodge company as a warehouse. Other parts of the structure will be leased to others. The building will be known as "Power and Transmission," and it is the intention of the company to make it the center for the sale and distribution of factory and mill supplies for power and transmission purposes. Occupancy is expected about May 1 of next year.

* * *

TEN acres at Eighty-third street and Woodlawn avenue, Chicago, have been purchased by the Niagara Radiator & Boiler Co., North Tonawanda, N. Y., from Briggs & Turivas, scrap iron dealers. The site will be utilized at once for a plant, the first unit to be erected to be 140 x 475 feet.

* * *

ORGANIZED to engage in general machinery repairing, the C. P. Weller Machine Co., Charleston, W. Va., recently took over the building formerly occupied by the Charleston Heat & Light Co. The Weller company was but recently organized and is backed by Charleston capital.

* * *

A M. CASTLE & Co., have started work on the erection of an addition to its plant at Blackhawk and North Branch streets, Chicago, to accommodate enlarged stocks of steel products. The structure will be 211 x 232 feet. Offices will be on the second floor. This extension will bring the company's floor space to five acres.

* * *

ANNOUNCEMENT has been made by the officials of the Imperial Drop Forge Co. of Indianapolis to the effect that large orders have been received from automobile manufacturers which has enabled the company to increase its production to a point near maximum. Company officials say the orders are the largest that have been received since the peak of last year.

* * *

THE plant of the Standard Process Steel Corp., North Broad street, Phillipsburg, N. J., has been sold to Col. W. P. Barba, Thirteenth and Cherry streets, Philadelphia, for what was said to be a consideration of $50,000. A new company is being formed which will take over the works and establish a plant for the manufacture of steel products.

* * *

THE American Tube & Stamping Co., Bridgeport, Conn., manufacturer of hot and cold rolled steel, etc., is reported planning the erection of large plant additions to its present factory building. It is stated that the plant now occupied by the Porcupine Co., maker of boiler and structural steel fabricator, will be taken over by the American company.

* * *

STOCKHOLDERS of the W. A. Jones Foundry & Machine Co. recently met at the Chicago offices of the company and elected T. A. Jones, president, to succeed W. A. Jones, deceased. Other officers elected at the meeting are: Vice president and treasurer, W. G. Jones; secretary, J. A. Sizer and assistant secretary, G. W. Page.

* * *

ANNOUNCEMENT has been made by the Reynolds Spring Co., Jackson, Mich., to the effect it will start immediately on the erection of an addition to its plant, to care for the increase in its business. July orders of the company are said to have passed any summer month on record, and an even greater volume of business is expected in August.

* * *

THE Inland Steel Co., of Indiana Harbor, has served notices on owners of lots and property in the vicinity of the company's holdings in Portage township, Porter county, Indiana, that engineers of the company would begin soon to survey the lines of the holdings of the company in the county. The Inland Steel Co. has made two purchases of land, totaling 640 acres, on which it plans to build a steel plant.

* * *

OPERATIONS will be started immediately in the plant of the Dayton Coal & Iron Co., Dayton, Tenn., which was taken over recently during bankruptcy proceedings by Joseph A. Squires and associates of New York. Properties of the Dayton company will be developed by the Astor Collieries which was recently incorporated in Delaware with a capital stock of $1,500,000.

* * *

PLANS are being prepared by Louis Adams and J. P. Hetherin, both formerly of the Marietta Mfg. Co., Point Pleasant, W. Va., for the establishment of an acetylene and electric welding plant at Huntington, W. Va. It is understood a building with approximately 1000 square feet of floor space will be leased and from 20 to 30 men employed.

* * *

MANUFACTURE of a contrivance for throwing clay pigeons will be undertaken by the Spangler Trap Shoot Mfg. Co., Chillicothe, O., which has leased a portion of a plant building. The company is said to have already ordered its machinery and equipment ,and it is expected will be ready to start operations no later than Oct. 1.

* * *

ADVICES have been received to the effect that a merger has been effected between the Stowell Co. and the Pelton Steel Co., both of Milwaukee, whereby the former secures the entire business of the Pelton organization. It is the new owner's intention to continue operation of the Pelton properties under the old name. Officers of the Stowell Co., under whose direction the Pelton company will hereafter be operated are: President, Fred W. Rogers; vice president and general manager, Rupert A. Nourse; secretary, Thomas E. Ward and treasurer, Henry J. Van Beek.

Steel Corporation Cuts Wages

Third Reduction Brings Day Labor Rate Down to 30 Cents an Hour, Rate Adopted by Many Independent Companies in July—$1 Per Day More Than Paid in 1915—Chairman Gary's Announcement

THE United States Steel Corp. has reduced wages of day labor from 37 to 30 cents an hour, effective Aug. 29. The announcement by E. H. Gary, chairman of the corporation, follows:

"In view of the prevailing low selling prices of steel as compared to costs of production, it is necessary to make reductions in wage rates, and therefore we will recommend to subsidiary companies that the general rates of day labor be decreased to 30 cents per hour, to become effective on Monday, Aug. 29, and that other wages and salaries be equitably adjusted."

This action follows closely on that taken by the majority of independent iron and steel companies in reducing to 30 cents or less per hour. The Steel corporation did not begin to reduce wages from the peak figure, $5.20, until May 16, this year, when a cut of 20 per cent became effective. On July 16, the corporation abolished the practice of paying 50 per cent extra for overtime, this change amounting to a reduction of 8.6 per cent in the day laborer's earnings for a 10-hour day. It brought labor down to 37 cents an hour. Independent companies in July reduced their rate to 30 cents, except that several large interests made a still greater cut, to 27 and 25 cents. The following table gives the Steel corporation's wage increases and reductions in detail since 1915:

	Wages 10 hrs	Per cent advance	Per cent advance over 1915
1915	$2.00	..	..
Feb. 1, 1916	2.20	10	10
May 1, 1916	2.50	13.6	25
Dec. 15, 1916	2.75	10	37.5
May 1, 1917	3.00	9	50
Oct. 1, 1917	3.30	10	65
April 16, 1918	3.80	15	90
Aug. 1, 1918	4.20	10.5	110
†Oct. 1, 1918	4.62	10	131
†Feb. 1, 1920	5.06	10	153
†May 16, 1921	4.05	*20	102.5
July 16, 1921	3.70	* 8.6	85
Aug. 29, 1921	3.00	*18.9	50

*Reduction.

†Basic 8-hour day in effect. Time and a half for overtime.

Government Analyzes Retrenchment

EMPLOYMENT in the iron and steel industry decreased 12.7 per cent in July in comparison with June, according to the current monthly report of the bureau of labor statistics of the department of labor. In eight of the 14 industries surveyed by the bureau there was an increase in employment in July, and in six a decrease, the largest of which was that in the iron and steel industry. One hundred and eighteen establishments reporting for the two months gave 115,411 as the number on their payrolls in June and 100,778 in July. Car building and repairing registered a loss in employment of 2.4 per cent, while in the automobile industry there was a gain of 3 per cent.

The iron and steel industry also reported the largest percentage of decrease in the total amount of payroll in July as compared with June. The outlay for this purpose dropped from $5,088,831 to $3,846,541, or 24.4 per cent. In car repairing the decrease was 14.9 per cent. In bituminous coal mining it was 8.7 per cent, while the automobile industry reported an increase of 0.1 per cent.

The iron and steel industry leads with the greatest reductions in comparing figures for July, 1921, with those for 1920. In the month last year, 189,770 were employed by the 118 establishments reporting, and this year, 101,638, or 46.4 per cent less. The nearest approach to this was in the automobile industry, registering a drop of 36.9 per cent in the year. In car building and repairing the decline was 32.3 per cent. All of the 14 industries reported reductions in the number employed, except cigar making, with a slight increase and the woolen industry, with an advance of 105.8 per cent.

The payroll of the 118 iron and steel companies in July last year was $13,683,927, and this year, $3,909,739, a reduction of 71.4 per cent. Commenting on the situation in the industry the report of the bureau states:

"In one mill, 75 per cent of the men were reduced approximately 18 per cent in wages. Four establishments reported wage rate decreases of 15 per cent affecting the entire force in two establishments, 38 per cent of the force in the third establishment and salaried foreman and rollers only in the fourth. A wage rate decrease of approximately 10 per cent affecting the entire force was reported by four plants. One firm cut the wages of 10 per cent of the force, 9 per cent. About 2 per cent of the men in another mill were reduced 7 per cent in wages. Business depression is reported throughout the industry, causing part-time employment and general reduction in the number of employes. The per capita earnings for July were 13.4 per cent less than the per capita earnings for June."

Decline in Living Cost

The cost of living in the United States on Aug. 1, 1921, was 62 per cent higher than in July, 1914, according to figures collected monthly by the National Industrial Conference board, New York. Between July and August, 1921, there was a decrease of 0.7 per cent. Between July, 1920, when the peak of the rise in the cost of living was reached, and Aug. 1, 1921, the cost of living declined 20.8 per cent.

LABOR NOTES

THE Associated Building Employers of Jackson, Mich., has been organized with A. N. Case, Case Mfg. Co., sheet metal contractors, as president. The organization is a unit of the Associated Building Employers of Michigan. The aim is to establish and maintain the American plan of employment.

Wages of 2700 employes of the Remington Arms Union Metallic Cartridge Co., Bridgeport, Conn., were reduced 10 per cent recently.

The board of directors of the Merchants, Manufacturers and Employers association, Stockton, Cal., is planning a general publicity campaign in furtherance of the open shop and to bring to the attention of employers the resources of the city. The industries of Stockton operate on the open shop basis.

Judge Chamberlin in circuit court in Indianapolis has held unconstitutional a section of an Indiana act, passed March 3, 1915, which provides a penalty for any employer who fails to pay any employe within 72 hours after the employe leaves his employer's service. The court made the ruling in a suit against the Spacke Machine & Tool Co.

Steel Exports Lowest in 7 Years

July Shipments Aggregate Only 85,520 Tons, Smallest Tonnage Since Month World War Began—Since Jan. 1, Only Shape and Pipe Tonnages Have Been Greater Than a Year Ago—Imports Gain Slightly

IRON and steel export tonnages of the United States in the past few months have been dropping away from the war time levels and touching close upon prewar shipments. July continued the slump in exports, the total for the month being slightly under the tonnage of August, 1914, seven years ago, the month the world war began.

The July exports of iron and steel totaled 85,520 tons. The nearest approach to this small volume is found in the records for August, 1914, when the outbound shipments aggregated 85,596 tons. This is a loss of 1076 tons from the exports of seven years ago. In the span of seven years the export tonnage previously has been expressed in thousands of three figures, once in September, 1916, soaring to 643,762 tons.

Prior to the July figures, comparison of the total exports for several months has been somewhat difficult because of the compilation including the months making up the first half of the government's fiscal year, but now that the period comparison begins with a seven-month basis, a more accurate gage of the trend of exports may be had. This situation now is more favorable because the slump in export tonnages did not assume sizable proportions until Jan. 1.

Examination of the accompanying tables for example, will show pig iron exports in seven months have dropped to a total of only 15,718 tons. A year ago this total was 63,064 tons; two years ago 226,077 tons; and three years ago 118,151 tons. For the same period exports of semifinished material were 4326 tons; 155,530 tons; 129,263 tons; and 1,122,051 tons, respectively.

In only five products did July exports exceed those of June. Outbound pig iron shipments totaled 2744 tons as against 1637 tons in June; wire rods 843 tons compared with 492; tin plate 2924 tons as against 2727 tons; cut nails 42 tons as against 29; wire nails 992 tons as against 951 and all other nails, including tacks, 445 tons as compared with 187.

The tonnage of structural shapes dropped from 18,058 in June to 11,320; pipe declined from 29,889 tons to 17,118 tons; sheets from 10,297 tons to 6819 tons; and other products in proportion. The July total, 85,520 tons, compares with 119,021 tons in June. A year ago the July total was 418,008; two years ago 287,685 tons; and three years ago 457,118 tons.

Structural shapes and pipe and fittings are the only products which in the seven months period this year have a greater export tonnage than in the same period of last year. Shapes have been exported in the aggregate of 244,810 tons this year as compared with 230,651 tons last year. Pipe exports totaled 326,498 tons this year as against 178,617 tons last.

IMPORTS AND EXPORTS

Gross tons

	1921 Imports	1921 Exports	1920 Imports	1920 Exports
Jan.....	17,104	546,402	45,796	333,514
Feb.....	3,672	394,638	32,279	308,846
March..	4,505	230,253	33,266	449,171
April...	4,935	162,793	26,032	395,256
May....	23,316	142,553	30,117	418,884
June....	8,260	119,021	37,260	397,420
July....	10,040	85,520	32,742	418,008
7 mos..	71,832	1,691,180	237,782	2,721,199
Aug....	.....	.....	58,335	431,519
Sept....	.....	.....	31,825	408,605
Oct.....	.....	.....	39,797	451,972
Nov....	.....	.....	50,995	434,290
Dec....	.....	.....	15,120	499,780
Total.	71,832	1,691,180	410,352	4,959,565

	1919 Imports	1919 Exports	1918 Imports	1918 Exports
Jan.....	16,932	370,876	12,475	490,259
Feb.....	11,819	340,623	12,940	432,465
March..	17,750	367,314	14,312	380,062
April...	16,561	402,653	11,247	463,035
May....	18,136	414,029	14,387	488,515
June....	21,761	562,954	13,913	418,178
July....	28,258	287,685	11,789	457,118
7 mos..	121,217	2,746,134	91,063	3,029,632
Aug....	28,990	396,112	12,862	511,782
Sept....	37,492	363,618	9,013	473,116
Oct.....	40,698	302,362	15,552	426,458
Nov....	43,855	336,959	11,329	439,268
Dec....	39,797	254,767	28,445	357,753
Total.	322,264	4,397,295	168,264	5,338,019

IRON AND STEEL IMPORTS

(Gross Tons)

	July 1921	July 1920	7 months ending July 1921	7 months ending July 1920
Pig iron....	2,567	7,335	15,595	81,387
Scrap	1,650	7,953	21,381	85,672
Bar iron....	274	564	1,006	2,468
Ing'ts, blooms and billets.	2,829	1,794	5,080	19,772
Struct. shapes	46	193	405	842
Rails	2,597	9,550	11,898	26,952
Sheets and plates	*	80	*	904
Tin and terne plate	....	18	308	223
Wire rods..	77	634	506	1,970
Total	10,040	28,121	56,179	220,190

*Error made; accurate figure not yet available.

IMPORTS VARIOUS ORES AND FERROALLOYS

(Gross Tons)

	July 1921	July 1920	7 months ending July 1921	7 months ending July 1920
Ferrom'g'se..	275	2,448	5,481	23,711
Ferrosilicon..	309	1,265	1,932	9,436
Mang'ese ore	5,028	18,447	297,403	234,989
Tungsten-bearing ore	47	71	856	881
Nickel ore...	139	3,814	1,497	20,265
Total	5,798	25,045	307,169	289,282

IRON ORE IMPORTS

(Gross Tons)

	July 1921	July 1920	7 months ending July 1921	7 months ending July 1920
From:—				
Spain	....	1,002	.....	44,421
Sweden	6,700	....	117,173	20,812
Canada	328	7,768	1,513	23,330
Cuba	....	11,616	97,125	473,145
Oth. countries	12	8,460	50,575	65,126
Total	7,040	28,846	266,186	626,834

IRON AND STEEL EXPORTS

(Gross Tons)

	July 1921	July 1920	7 months ending July 1921	7 months ending July 1920
Pig iron....	2,744	29,133	15,493	128,995
Scrap	1,524	24,902	24,198	84,348
Ing'ts, blooms and billets.	363	17,243	4,326	155,530
Wire rods..	843	12,258	10,963	77,232
Steel rails..	20,074	51,410	256,938	333,344
Steel bars..	5,395	55,803	152,701	363,288
Iron bars....	149	3,373	11,289	22,388
Struct'l iron and steel..	11,320	36,010	244,810	230,651
Hoops, bands and scroll..	1,263	4,733	13,393	31,906
Galv. sheets and plates.	2,609	10,643	40,587	63,833
Iron sheets and plates.	652	1,802	9,756	17,662
Steel plates..	6,204	58,360	283,928	494,505
Steel sheets..	6,819	15,220	70,460	92,261
Ship. and tank plates punched and shaped	294	5,522	9,401	25,000
Tin and terne plate	2,924	17,552	77,302	140,040
Barbed wire.	1,431	10,438	20,372	72,151
All oth. wire	521	17,359	55,689	94,256
Cut nails...	42	354	588	1,295
Wire nails..	992	8,184	17,295	43,750
All oth. nails incl. tacks.	445	879	3,243	6,488
Pipes and fittings	17,118	32,236	326,498	178,617
R. R. spikes	415	1,270	6,558	9,795
Bolts, nuts, rivets	1,128	2,639	19,449	22,290
Horseshoes ..	13	198	364	879
Cast radiators	238	487	1,644	4,284
Total	85,520	418,008	1,677,245	2,694,788

EXPORTS PIG IRON AND SEMIFINISHED

Gross tons

	1921 Pig iron	1921 Semi-finished material	1920 Pig iron	1920 Semi-finished material
Jan.....	3,926	315	18,468	19,937
Feb.....	1,307	92	15,573	22,693
March..	2,320	1,023	21,638	30,444
April...	1,243	678	14,575	19,032
May....	2,541	749	12,864	16,370
June....	1,637	1,106	16,799	29,811
July....	2,744	363	29,133	17,243
7 mos..	15,718	4,326	63,064	155,530
Aug....	.....	.....	22,645	20,920
Sept....	.....	.....	22,724	18,113
Oct.....	.....	.....	17,267	11,853
Nov....	.....	.....	13,929	7,042
Dec....	.....	.....	10,055	3,415
Total.	15,718	4,326	214,514	216,873

	1919 Pig iron	1919 Semi-finished material	1918 Pig iron	1918 Semi-finished material
Jan.....	36,757	11,594	20,581	195,385
Feb.....	20,925	9,900	10,711	166,807
March..	22,158	8,176	9,849	144,443
April...	17,038	11,488	11,282	177,128
May....	37,087	20,771	22,567	159,299
June....	39,785	46,016	22,896	139,377
July....	42,327	21,318	20,265	139,612
7 mos..	226,077	129,263	118,151	1,122,051
Aug....	36,071	36,162	26,028	189,851
Sept....	18,991	37,513	34,494	135,450
Oct.....	14,108	20,713	35,452	125,023
Nov....	21,429	13,211	30,825	149,924
Dec....	14,612	21,538	24,625	63,890
Total.	321,261	258,400	269,575	1,786,189

Machine Tools Moving Slowly

Equipment Users Show Little Interest in Machinery Offerings—Orders Represent Actual Requirements—Prices Are Extremely Weak and Concessions Are Obtainable—Buying Revival Is Expected by Dealers Next Month

DESPITE the fact industrial operations in the metalworking industry are reported steadily increasing, the improvement as yet has not been reflected in the market for machine tools and shop equipment. Orders for tools during the past week were few and far between and an exceptional order was one for more than a single machine. So far as known, only one sizable order was placed in the East, this being a school project, while in the Middle West, an unverified report was in circulation to the effect a large dealer purchase of a number of low-swing lathes and grinders had been successfully negotiated.

Perhaps the only encouraging feature of the market, from the standpoint of the tool seller, is the fact that inquiries continue to come in at a fair rate. None of these are sizable, but it is felt that they indicate a buying movement in the near future. There seems to be an undercurrent of optimism in the market and most dealers feel confident a fair buying movement will begin some time next month. The railroads are not considered immediate buyers, although it is felt they will come into the market as soon as they are properly financed by the government.

Machine tool prices are weak, but on paper continue to hold at the established level. This latter, however, no longer means anything, as dealers report, due to strong competition, it is possible for a tool buyer to get a good concession on almost any kind of an order. Some tool manufacturers have gone so far as to announce reductions, it being estimated milling machine prices are now approximately 30 per cent under those existing at the first of the year. Some makers of small tools have also announced a reduction. As yet the price cutting has not resulted in any appreciable increase in business, and it is apparent users will not buy until the demand for their products has increased.

Few Machinery Orders Are Placed in the East

NEW YORK, Aug. 23.—The slight improvement noted recently in demand for machine tools has disappeared, the market now seemingly to be as listless as at any time. Such buying as is being done is comprised almost entirely of small scattered orders. One order the past week called for several small machines for the board of education, this city, making in all a total of 27 machine tools to have been placed within the past two weeks. The railroads, as yet, are showing little interest. No orders are reported in any quarter and little or no new inquiry has developed. Price reductions include a 15 per cent drop on a line of lathes.

The Wonham, Bates & Goode Trading Corp., this city, has taken an order from Takata & Co. for two rotary pressure blowers for export.

Included in recent crane awards are two 7½-ton electric cranes, 38-foot span, for Davies & Thomas, Inc. Catasaqua, Pa., to be erected by the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y. A 30-ton crane, with 44-foot span, has been placed by the Richardson Scale Co., Passaic, N. J. It is reported the order went to the Shaw Electric Crane Co., Muskegon, Mich. Little else in the way of orders has been reported.

Stone & Webster, Boston, are inquiring for a 50 and a 10-ton electric overhead crane for the proposed Green Island plant of the Ford Motor Co., Troy, N. Y. The bureau of yards and docks, Washington, is inquiring for a 50-ton electric overhead crane for the South Boston navy yard.

Other orders include a 10 and a 20-ton electric crane, 40-foot span for the Anderson Meyer Co., 80 Wall street. These cranes went to the Whiting Corp., Harvey, Ill. and are for export. A 10-ton crane has also been placed with the Whiting Corp. by the Adirondacks Light & Power Co., Amsterdam, N. Y.

Business Is Not Improved

CHICAGO, Aug. 23.—Business among dealers in machine tools so far this month has not developed any improvement over that of July and signs point to a lower total sales in many cases than in the previous month. Purchases by the Illinois Central railroad were booked the final week of July and counted for that month, although the formal orders have just been received. Talk of radical reductions by many sellers was rife when the business was placed but general denial is entered by many dealers. It appears that some of the equipment was not competitive and prices were not materially reduced, while in some other lines sharp cuts were made.

Market Continues Inactive

PITTSBURGH, Aug. 23.—That the Wheeling Steel Corp. has shelved its crane requirements for its Beach Bottom plant was confirmed this week. While this corporation is understood to have purchased some rolling mill equipment for its Portsmouth and Steubenville, O. plants, present construction is not far enough advanced to warrant any action being taken on crane equipment. A canvass of the trade this week reveals only a few orders for cranes were closed. Sales include one 10-ton 3-motor electric traveling unit with 40-foot span for the Ladel Mfg. Co., New Philadelphia, O., for erection in its new foundry. Another embraced two 3-ton 2-motor traveling cranes for the American Laundry Machine Co., Detroit. Generally, however, the market is extremely quiet with few or no inquiries before makers and the outlook is not bright.

No aizable inquiry is before the machine tool trade and extreme quietness is reported. Proposals covering the machine tool equipment for the Canton High school, Canton, O., have been called off and it is understood the school board will ask for new bids. Five inquiries calling for preliminary figures on machine tools are current, but little business can be expected soon from this direction. That many machine tool companies anticipate a revival in business is shown by the fact they are relocating machinery at their plants to keep their working force intact and are doing considerable shop repair work. One machine tool dealer recently sent out several thousand copies of a stock list including new and secondhand equipment to the trade east of the Mississippi river for the purpose of testing out the market. A fair amount of inquiries resulted, the majority of which desired certain information, either for reappraisement of inventories, or for the present market value of a machine which was about to be sold. This is indicative of the present market; inquiries are scant and those that are received often lead the dealer on a wild goose chase. In the secondhand equipment market, last week's sales included a 4-foot radial drill.

Sales Are Encouraging

BOSTON, Aug. 23.—After the extremely dull market a week ago sales of half a dozen or more new tools during the past week are regarded by the trade as decidedly encouraging. Inquiry seems to have improved and the sentiment among buyers is better. Despite this, no buying movement of size is looked for by machinery dealers until greater confidence in price stability is manifested by buyers. Several New England manufacturers, known to be tentatively in the market for equipment, are reported as waiting until prices have dropped materially below the present levels. The feeling that prices are about to decline is spreading and this is given encouragement by the softness in many lines. Milling machines have practically all been marked down an additional 15 per cent since the first of the month, making approximately a 30 per cent reduction for the year. A few manufacturers still hold to the old figures but the leading makers are now on the lower level. Manufacturers of small tools and chucks have announced a slight increase in dealer's percentages. Other lines including lathes and planers show softness here and there, although some manufacturers still maintain prices will not be reduced. Sales during the week include a milling machine, drill press and power saw, to an eastern Massachusetts general repair shop. Three individual tools to textile interests and a radial drill and lathe to unclassified users. Second hand equipment has moved at about the same rate as heretofore, sales in most cases being governed by low prices. Active inquiry is for individual tools only, but some larger lists are expected to develop in the early fall. A 50-ton steam locomotive crane is wanted by the government, for South Boston, Mass. and bids close Sept. 7 at Washington. The auction of government property on Aug. 23 at the Army supply base, Boston, includes machinery and miscellaneous equipment.

Dealers Expect Improvement in Demand

MILWAUKEE, Aug. 23.—Some machine tool and equipment manufacturers in this district report that since July 1 there has been a noticeable picking up in practically all lines of manufacture, and this eventually is expected to be reflected in a demand for machinery and tools. At present a fair run of orders is being received by tool makers, most however consisting of single tools wanted for immediate delivery. Dealers are offering large quantities of used equipment and report this class is moving better than it has for some time past. Until these stocks are disposed of, or at least substantially reduced, it is believed very unlikely that new tool business will be very great.

Despite the present dull condition of the market, due to the unmistakeable signs of a recovery in the iron and steel business and the prevailing opinion that a real improvement is now on its way for the metalworking trades, the feeling in the tool trade in this district, is more cheerful than it has been since early spring.

Buying Outlook Is Better

TORONTO, Ont., Aug. 23.—Business in the Canadian machinery and machine tool market has been exceptionally quiet during the past week. The outlook for the future, however, is much brighter and dealers are of the opinion more activity will be a feature later on. New manufacturing companies are being formed and incorporated in fairly large numbers, and while there are only a small number of these who will be erecting plants this year, it is expected a considerable building boom will feature 1922 in regard to industrial plants and additions. The Canadian railroads are in need of equipment, but are deferring purchases as long as possible. The Dominion government, Provincial governments and Municipal governments have been active buyers of equipment for electric plants, waterworks and sewage plants, as well as equipment for numerous other public undertakings, and it is expected that these will continue to hold up their end of the buying movement. On the other hand the majority of manufacturing plants throughout the Dominion are experiencing a big slump in demand with the result they have greatly reduced their operations, and but few are in need of machinery or tools for replacement purposes.

New machinery and tools are moving in a very quiet manner, with users buying only what they are urgently in need of. Used equipment is still more active than new lines. Small tools are in fair demand to the extent of users immediate requirements, but there is no future buying being done in these lines, and no manufacturer is putting in big stocks. Despite the recent announcement of a drop in prices on small tools, buying has not improved and practically all users are buying on a hand-to-mouth basis. No further announcements of price reductions have been made during the past week, although it is understood some dealers are shading in order to secure new business.

Expect Demand To Revive in September

CLEVELAND, Aug. 23.—With the passing of the summer months demand for machine tools and equipment is expected by dealers in this district to show a decided improvement over that of the past nine months of the year. June, July and August, even in times of unprecedented prosperity, usually are dull months as far as equipment sales go, and the present summer season has been much lower than that of normal times, due to the general industrial depression. However, September is expected to bring with it an upturn in demand, which although not of large proportions, will be indicative of much greater activity when business starts on a normal scale.

Few tools were moved by dealers in this district in the past week. Most orders were for single tools and these were few and far between. Used machinery was more in demand than new, but even this class was less in demand than it has been. No outstanding business was done and little is expected before next month.

Indicative of better demand in September is the number of inquiries being received by dealers. One alone reported the receipt of 15 in a day, while others report receiving

requests for prices on from five to 10 tools. The largest job on which dealers here were working, that of the McKinley high school, is still pending. The board of education of Canton, O., which had asked for bids, has rejected all those submitted and has issued a new list. It is expected these new bids will be closed some time next month. On this job it is understood some secondhand machinery is being considered. It is also understood in this district that an Eastern machinery dealer recently closed on the inquiry from a Middlewest dealer for a number of low-swing lathes and grinders, but this lacks verification. Among inquiries which recently came out in this district the following are evoking some interest: The Madden, Atkinson Auto Co., Columbus, O., which wants a lathe, drill press, grinder and shaper; the Defiance Screw Machine Products Co., Defiance, O., which has asked for a horizontal drill; the Hydraulic Press Mfg. Co., Mt. Gilead, O., which asked for prices on a cut-off saw and the National Supply Co., Toledo, O., which inquired for a drill. There are no railroad inquiries current here, except those for single tools which have been issued from time to time. No buying by the railroads is expected until the government settlement has been completed. At present this appears to be in the distant future.

Quoted machine tool prices continue to stand at the established levels, but concessions are obtainable on almost any kind of an order. Many tool users are holding off in the expectation of lower prices. Second hand machinery prices are extremely weak, it being understood that buyers can practically name their own prices.

Auction sales are reported here and there by many manufacturers who are clearing their shops of all old and obsolete equipment. Tool dealers think this action is indicative of a decision by progressive firms to retool their shops with new and more modern equipment, and in a number of cases this is known to have happened.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

East of the Mississippi River

BIRMINGHAM, ALA.—The Welded Products Co. has increased its capital from $50,000 to $100,000 for the purpose of expanding its business.

BRISTOL, CONN.—Large site has been purchased in Tylerville, near here, by C. G. Garrigus for a plant to manufacture machinery.

HARTFORD, CONN.—D. A. Minor plans a garage building, one story, 100 x 150 feet, to be built at an estimated cost of $65,000.

MILFORD, CONN.—The Edgewood Stamp Co. has increased its capital from $10,000 to $100,000.

NEW HAVEN, CONN.—The Edward Malley estate is to erect a 1-story, 80 x 100-foot power plant at an estimated cost of $150,000.

NEW HAVEN, CONN.—Bids are being received by Wescott, Mapes, Inc., on a $150,000 factory for the National Folding Box & Paper Co.

ORANGE, CONN.—The New Haven Machine Co. has increased its capital from $25,000 to $75,000.

CHICAGO—The McDowell Machinery Co., 550 West Washington street, has been incorporated with $10,000 capital stock, by C. B. Burns, W. J. McDowell and others.

CHICAGO—The Sterling Trap Co., 802 West Monroe street, has been incorporated to manufacture traps, etc., with $5000 capital stock, by E. K. Hess, J. H. Clark and others.

CHICAGO—The J G. Pressler Co., 326 West Madison street, has been incorporated to manufacture and deal in automobile accessories, etc., by John G. Pressler and others.

CHICAGO—The Illinois Bird Adding Machine Co., 38 South Dearborn street, has been incorporated with $15,000 capital stock to manufacture adding machines, etc., by A. R. Tice, A. N. Fox and others.

CHICAGO—The Pasceo Oil Burner, 15 East Van Buren street, has been incorporated with $10,000 capital stock, to manufacture oil burners, etc., by Paul Mooney, T. J. Scofield and others.

CHICAGO—The Emil Schwarz Co., 217 West Illinois street, has been incorporated with $150,000 capital stock, to manufacture and deal in wrenches, tools, etc., by Emil Schwarz, C. A. Schommer and Frank Wilenski.

HOMEWARD, ILL.—The Ideal Utilities Corp. has been incorporated with $10,000 capital stock to manufacture dish washers, etc., by O. D. Kinsey, W. E. Howes and Ora C. Gilkey.

BETHEL, ME.—Mechanical & Electrical Mfg. Co. has been incorporated for $100,000 by Theodore Morin and others.

BOSTON—Electric Highway Signal Co. has been incorporated for $10,000 by Charles B. Putnam, 32 Queensbury street, and others.

BOSTON—The Boardman Mfg. Co. has been incorporated to make automobile accessories with 1000 shares of stock without par value by James H. Old, H. V. Tillson and R. H. Davison.

BOSTON.—The Haug Paper Machinery Co. has been incorporated with $100,000 capital by Anton J. Haug, Nashua, N. H., Joseph Simon, Arlington, Mass., and Archie E. Balter, Allston, Mass.

BOSTON—W. H. Maxwell, Inc. has been incorporated to build vending machines with $10,000 capital by L. R. Chamberlin, Clinton A. McLane, Belmont, Mass., and Thomas L. Gannon.

BOSTON—S. A. E. Steel Corp. has been organized with a capital of $50,000 to deal in iron, steel and other materials. The directors are Paul R. Curtis, president; R. H. Sprague, of Quincy, treasurer, and W. E. Pinkham.

CAMBRIDGE, MASS.—The Cambridge Gas Light Co. plans a 1-story power house and boiler plant at an estimated cost of $60,000.

LYNN, MASS.—Globe Machine Co. has been incorporated for $2000 by Edwin T. Skorman of Lynn, and others.

SPRINGFIELD, MASS.—The Woodward Wrench Co. has been incorporated with $500,000 capital by William S. Thompson, Charles M. Comins, Longmeadow, Mass., Benjamin W. Woodward and Euclid A. Blanchard, Chicopee, Mass.

SPRINGFIELD, MASS.—The Arrow Light Co. has been incorporated to make automobile indicators with $30,000 capital by Tadeuza M. Marczak, and Kazimerz T. Marczak, both of Chicopee, Mass., Adam W. Jentoch and Gurdon W. Gordon .

BERGENFIELD, N. J.—American Wood Works has been incorporated with $125,000 capital to manufacture wooden articles. The incorporators are James Lomedico and E. Howard Foster, of Bergenfield.

BRIDGETON, N. J.—A $12,000 foundry will be erected here by the Joseph Foy Co. W. P. Cameron Engineering Co., Philadelphia, is preparing plans.

CAMDEN, N. J.—Work will be started shortly on a $40,000 plant for the Wilson Motor Co.

CLIFTON, N. J.—The National Metal Products Co. has been incorporated with $50,000 capital by Albert R. Bray, Clair S. Wells and Myron L. Wells.

CLIFTON, N. J.—National Metal Products Co. has been incorporated with $50,000 capital to make metal products, by Albert R. Bray, Clair S. Wells and Myron L. Wells, all of Clifton, N. J.

HOBOKEN, N. J.—The Summit Brass & Bronze Works, Inc., 700 Madison street, recently was incorporated with a capital stock of $100,000,

to manufacture chandeliers, electroliers, etc.

NEWARK, N. J.—The Tousek Engineering Corp. has been incorporated with a capital stock of $100,000. Offices are at 228 Jeliff avenue.

NEWARK, N. J.—Weber's Peral Bath Co. has been incorporated with $50,000 capital to manufacture bath equipment. The incorporators are Charles Weber Sr., of Newark, Charles Weber Jr., and Henry L. Shanks, of East Orange, N. J.

PERTH AMBOY, N. J.—The Standard Underground Cable Co. contemplates extensions and alterations to its plant at a cost of $250,000.

TRENTON, N. J.—Universal Coal Machine Co., Little building, Boston, will erect a machine shop here.

WEST ORANGE, N. J.—Sterling Watch Co., Inc., has been incorporated with $200,000 capital to make clocks. The incorporators are Benjamin Webster, G. H. Barbour, New York, and C. B. Lee, of Nutley, N. J.

BROOKLYN, N. Y.—The Instantaneous Electric Water Heater Corp. has been incorporated with $5000 capital stock, by M. Holland, L. Feinman and S. Rubinton, 32 Court street.

BUFFALO—The Bradley Pattern Works, Inc., has been incorporated by J. W. Bradley, F. Leney and H. Scheibel to manufacture wood and metal patterns.

LONG ISLAND CITY, N. Y.—The Blueblaze Motor Specialties Corp. has leased a 2-story building in which it will establish a plant for the manufacture of automobile equipment.

NEW YORK—The Beacon Lighting Fixture Co. has been incorporated to manufacture gas and electric fixtures, by L. E. McMahon and E. A. Reilly, 1482 Broadway.

NEW YORK—The Pt. Morris Iron Works has been incorporated with $6000 capital stock, by M. Frazer, P. Goodstein, M. Dragone and A. D. Schanzer, 63 Park Row.

NEW YORK—The K. M. K. Woodworking Co. has been incorporated with $14,000 capital stock, by M. Koron and C. S. and H. Hirvin, 435 Rockaway avenue.

NEW YORK—The Two-in-One Permanent Waving Machine Co. has been incorporated with $10,000 capital stock, by J. De Ruvo, H. J. Fritsch and A. De Cicco, 132 Nassau street.

POUGHKEEPSIE, N. Y.—The A. L. Nichols Mfg. Corp. has been incorporated with $50,000 capital, by J. W. Allgaze and C. F. Malcolm, to manufacture electrical products.

SCHENECTADY, N. Y.—The Pendell Boiler Co. has increased its capital stock from $100,000 to $200,000.

AKRON, O.—The Achron Wrench & Vice Co. has been incorporated with $500 capital stock by John R. Long, K. M. Long and others.

AKRON, O.—The Falor Mfg. Co. has been incorporated with $50,000 capital stock, by A. Falor, C. F. Schnee, John C. Crimm, Joseph Thomas and Julia Hill.

CINCINNATI—The Globe Metallic Works, Gest street, has purchased a site on which it plans a factory building, 40 x 95 feet.

CLEVELAND—The Superior Screw & Bolt Mfg. Co. has increased its capital from $750,000 to $950,000.

CLEVELAND—The Auto Electrical Maintenance Co. has increased its capital stock from $10,000 to $75,000.

CLEVELAND—The Tuscora Tire Co. has been incorporated with $500 capital, by William A. McAfee, A. B. Oakes, T. F. Veach, A. A. Stambaugh, and others.

SPRINGFIELD, O.—The Bauer Bros. Co. plans to increase its capital from $450,000 to $550,000.

WARREN, O.—The Warren Rubber Co. has increased its capital stock from $100,000 to $200,000.

YOUNGSTOWN, O.—The Metal Products Co. has been incorporated with $50,000 capital, by F. R. Weinrich, W. F. Ullman, A. M. Frankle, Lee Rosenbaum and David Steiner.

ALLENTOWN, PA.—The Automatic Devices Co. has been incorporated with $10,000 capital stock to manufacture mechanical devices, etc., by Irving Samuels, Hunsicker building, Robert B. Klotz and Taylor Fogel.

BETHLEHEM, PA.—Plans are being tentatively considered by the Keystone Supply & Mfg. Co. for a plant to cost, including equipment, $200,000. The company manufactures pipe and plumbers' supplies.

LANSFORD, PA.—The Carbon Battery & Electric Co. has been incorporated with $5000 capital stock to manufacture and repair electric batteries, etc., by Milton Kleckner, T. J. Jenkins, Charles Reibe and F. W. Heister.

NORRISTOWN, PA.—The Franklin Air Compressor Works has been incorporated with $50,000 capital stock, by George C. Yates, 27 West Pomona street, Philadelphia, and others.

PHILADELPHIA—A $10,000 factory building will be erected here by the Richter Machine Co., manufacturer of textile machines.

PHILADELPHIA—A $500,000 plant will be erected here by the Daniels Motor Co., Reading, Pa., manufacturer of automobiles.

PHILADELPHIA—General contract for a 2-story factory, 30 x 61 feet, has been awarded to G. J. Reich by Albert G. Schurhler.

PHILADELPHIA—A $30,000 factory building will be erected at Victoria and Richmond avenues by John M. Kennedy. Eugene A. Stopper is architect in charge.

PHILADELPHIA—The Philadelphia Automobile Lamp & Radiator Repair Co., 1304 Callowhill street, is completing plans for a 3-story factory building, 16 x 95 feet, to cost about $30,000.

PHILADELPHIA—The Silencer Mfg. Co. is being organized by T. F. Rose Jr., John H. Moran and John J. Baker, to manufacture telephone attachments and mechanical devices. It is represented by John Weaver, Commercial Trust building, and others.

PHILADELPHIA—The Tioga Engineering & Pattern Co. has been incorporated with $65,000 capital stock, to manufacture patterns, machinery, etc., by William S. Cox, Fifth street and City Line, Albert G. Schleher Jr., Mt. Carmel and Cricket avenues, and Benjamin G. Slaughter, Bryn Mawr.

PITTSBURGH—The Scientific Specialty Co. is being organized by Joseph C. Keany, C. D. Stewart and C. L. McCobb, to manufacture light hardware products. C. L. McCobb, 425 Wabash building, represents the company.

PITTSBURGH—The Standard Electric & Radio Corp. is being organized by David Rose, T. H. Lewis and C. O. Fisher, to manufacture electrical equipment, etc. B. P. Brasley, Bakewell building, represents the company.

POTTSTOWN, PA.—Bids will be received shortly by William H. Lee, architect, on a large warehouse for Peter Greenburg.

READING, PA.—The Electric Manganese Steel Co. has been incorporated with $75,000 capital stock to manufacture iron and steel materials, by Ray A. Houck, 117 West Windsor street, Samuel McClure, Ninth and Penn streets, and Alvin Schmehl, 721 Lincoln street.

WATSONTOWN, PA.—The B. F. Harpel Co. has been incorporated with $5000 capital stock to manufacture castings, etc., by G. Frank Rickert, 612 Court street, Reading, Pa., B. F. Harpel and Charles K. Derr.

PROVIDENCE, R. I.—Henry Owens & Co., Inc., has been organized for $10,000 to deal in tools. Henry Owens of Maywood avenue is an incorporator.

PROVIDENCE, R. I.—Miller's Sons, Inc., has been incorporated with $100,000 capital to make electrical goods by Bernard H. Miller, Henry J. Miller and Samuel Miller.

PROVIDENCE, R. I.—The Yankee Carbon Monoxide Burner Co. has been incorporated with $50,000 to make oil burning heating devices, by Roy J. Obermeyer, M. J. Morse and R. A. Morse.

PROVIDENCE, R. I.—The Marshall &

June Machinery Exports Show Gain

EXPORTS of metalworking machinery and machine tools in June were valued at $1,427,714, which was an increase of $151,743 as compared with the exports for the preceeding month, according to the monthly bulletin of the United States department of commerce, bureau of foreign and domestic commerce. American machinery was bought by interests in 59 different countries or provinces. Miscellaneous equipment valued at $1,029,230 represented the bulk of shipments, while exports of machine tools other than lathes and sharpening and grinding machinery, were valued at $267,344. Lathes valued at $131,140 were exported while foreign buyers took approximately $60,499 of sharpening and grinding machinery.

Japan was the largest buyer, exports to that country being $524,776 in miscellaneous tools, sharpening and grinding machinery to the extent of $5689 and $68,476 of other machine tools. France was the next largest buyer, her total purchases being valued at approximately $161,900. German purchases of American tools approximated $300 in value. Haiti's purchases were the smallest exports to that country, being valued at but $15. China was the largest buyer of lathes, exports of this class of tool to that country being valued at $23,693. The largest importer of American sharpening and grinding machinery during the month was Canada, her imports of this class of American machinery being valued at a little more than $14,000.

Williams Mfg. Co., Inc., has been incorporated to build textile machinery by John H. Williams, Robert Marshall, M. L. Marshall, and H. E. Williams.

BRISTOL, VA.—The Enterprise Foundry Co. will remodel its local plant which was formerly owned by the Virginia Iron, Coal & Coke Co.

NORFOLK, VA.—The Hampton Roads Equipment Co., 251 Arcade building, has been incorporated with $150,000 capital by J. M. Sherrod, L. P. Beard and W. L. Duncan, to manufacture conveying and road building machinery, etc

CEDARBURG, WIS.—Fred Schuette, city clerk, is taking bids until Aug. 30 for a 50,000 gallon steel tank, on a 90-foot steel tower, for the new city water works plant, being constructed at a cost of $165,000. At the same time bids will be closed on a pumping station, 30 x 36 feet, and a concrete reservoir, and compressor and pumping equipment. W. G. Kirchhoffer, consulting engineer, Madison, Wis., is supervising the work.

CHARLESTON, W. VA.—The C. P. Weller Machine Co. has been organized and will take over the building formerly occupied by the Charleston Heat & Light Co. The company will engage in general machinery repairing.

MARTINSBURG, W. VA.—The Hancock Steel Co. is completing plans for the initial unit of its plant at Hancock, Md., which will be one story, 130 x 200 feet, and which will be equipped as a foundry and machine shop.

WHEELING, W. VA.—The Wheeling Metal Specialty Co., Nineteenth and Jacob streets, has taken over the interests of the Wheeling Stove & Range Co., and will engage in the manufacture of stoves and other metal products.

DODGEVILLE, WIS.—A. H. Hintz of Davies & Hintz, has rented a building which it plans to fit up for use as a machine shop.

EDGERTON, WIS.—The Highway Trailer Co. contemplates a factory and assembly building.

MADISON, WIS.—A $10,000 addition will be erected by the Capital City Pattern Co., 613 Williamson street. W. J. Gregerson is president.

MANITOWOC, WIS.—The Wiese Laboratory Furniture Co. has been awarded the contract to equip and furnish the laboratories of the new Bay City (Mich.) high school at $30,000, and the new Fond du Lac (Wis.) high school at $12,000.

MARIBEL, WIS.—Straw cutters and attachments for farm feed cutters and silo filling machinery will be manufactured by the Maribel Strawcutter Co., a new $50,000 concern incorporated by Henry Elmer, of Manitowoc, Wis. Work has been started on a 1-story factory, 50 x 100 feet, to be ready about Sept. 15.

MILWAUKEE—The Peerless Electric Co., 2028 Fond du Lac avenue, has engaged Architects Bruecker & Tharinger to design a new shop and warehouse, 47 x 120 feet.

MILWAUKEE—A public garage, machine shop and service station costing $50,000 will be erected at Twenty-fifth street and North avenue by Pauly & Marx, Inc., a new $75,000 corporation of which Louis C. Pauly Jr. is president. It will be 116 x 136 feet.

MILWAUKEE—Articles of incorporation have been filed by the Economy Sheet Metal Works, which is capitalized at $5000 to manufacture sheet metal goods of all kinds. The incorporators are H. Rumpel, H. Eifert and William Ehmke, 1140 Teutonia avenue.

MILWAUKEE—The Milwaukee-Western Fuel Co., 1400 Wells building, will build a fireproof building, 136 x 140 feet, at Clinton and South Pierce street, to be equipped as a private garage for its fleet of 100 motor trucks, and a maintenance station for trucks and repair shop for its coal docks. Two 5-ton electric cranes will be purchased. William F. Arden is vice president in charge.

MILWAUKEE—A public garage, with machine and repair shop, 57 x 127 feet, 2-story and part basement, will be erected at Van Buren and Martin streets by the Van Buren Garage, Inc., a new $30,000 corporation organized by Theodore M. Ackerman, 174 Ogden avenue, Herman Schwartz and L. E. Hurt.

MILWAUKEE—The Badger Concrete Mixer Co., Majestic building, Milwaukee, has acquired a site at Winthrop Harbor, Ill., suburb of Kenosha, Wis., and will build a 1-story machine shop and factory, 80 x 260 feet, equipped for the manufacture of concrete mixers, paving outfits, etc. E. M. McVicker is general manager.

PRAIRIE DU SAC, WIS.—The board of education will take bids soon for a 2-story addition, 59 x 60 feet, to the high school, to be used for manual training and domestic science instruction. Architects Law & Law, Madison, Wis., are in charge.

RACINE, WIS.—Articles of incorporation have been filed by the Clark Cylinder Regrinding Co., organized with $25,000 capital stock by John Clark and L. P. Baumblatt.

Business in Canada

TERRACE, B. C.—George Little will call for bids soon for erection of a sawmill at a cost of $30,000, to replace one recently damaged by fire.

HAMILTON, ONT.—The Wallace Barnes Co., Ltd., has been incorporated to engage in the manufacture of iron and steel products, etc., with $300,000 capital stock, by C. W. G. Gibson, Robert F. Inch and others.

HAMILTON, ONT.—The Wire Co. of Canada, Ltd., has taken over the building and equipment of the MacPherson Wire Co., Ltd., here and will start immediately on the production of wire and stamping specialties, etc.

HAMILTON, ONT.—The National Slag Products, Ltd., recently incorporated with $300,000 capital stock, will build a manufacturing plant here for the making of tile, brick, roofing materials, etc. The directors of the company include: William H. Yates, Hamilton, president; David Dick, Welland, Ont., vice president; J. P. Anglin, Montreal, Que.; Hon. G. D. Robertson, Ottawa, Ont.; H J Daly and W. R. Fleming, of Toronto, Ont.; George Hutton and E. J. Robertson, Hamilton, Ont.

LONDON, ONT.—E. Leonard & Sons, York street, will build addition to plant here to cost $35,000.

PORT ARTHUR, ONT.—The contract for the foundation for paper mill to be erected here at a cost of $2,000,000 for the Provincial Paper Mills, Ltd., 54 University avenue, Toronto, Ont., has been awarded to Chambers, McQuigge & McCaffrey, Port Arthur, Ont.

SMITHVILLE, ONT.—The Smithville Metals, Ltd., recently incorporated, will erect a factory here to cost $11,000, and has let the steel contract to the Standard Steel Construction Co., Welland, Ont.

TORONTO—The Ideal Sewing Machine Co., Ltd., has been incorporated to manufacture sewing machines, etc., with $150,000 capital stock, by Edwin Mandeville, A. M. Mandeville and others.

TORONTO—The Canadian Shade Co., Ltd., has been incorporated to manufacture electric machinery and apparatus, with $200,000 capital stock, by Edgar W. White, G. V. Draper and William E. Johnson.

TORONTO, ONT.—The British American Fuel & Metals, Ltd., has been incorporated as iron founder and steelmaker, with $50,000 capital stock, by Thomas Gibson, Henry C. Draper and Edward M. Stoer.

TORONTO, ONT.—The Simplex Iron & Tool Co., Ltd., has been incorporated with $40,000 capital to manufacture iron, steel, machinery, tools, etc., by James B. Roaf, room 203, 95 King street east; John Creighton, and others.

TORONTO, ONT.—The Provincial Motors Livery, Ltd., has been incorporated with $150,000 capital to manufacture and deal in motor cars, engines, trucks, automobiles, etc., by Norman B. Allen, 35 Palmerston Gardens; George T. Walsh, 213 Manning Chambers, and others.

TORONTO, ONT.—The National Fibre Co. of Canada, Ltd., has been incorporated to manufacture fibre, insulating paper, etc., with $40,000 capital stock, by Edward W. Wright, 120 Bay street; Ewart R. Lynch, 86 Erskine avenue, and others.

TORONTO, ONT.—The Simplex Iron & Tool Co., Ltd., has been incorporated to manufacture iron, steel, machinery, tools, etc., with $40,000 capital stock, by James B. Roaf, room 203, 95 King street east; John Creighton, and others.

TORONTO, ONT.—Wright Bros., Ltd., have been incorporated to manufacture and deal in heating appliances, furnaces, etc., with $40,000 capital stock, by Daniel J. Coffey, 1001 Bank of Hamilton building; Thomas J. Glover, and others.

TORONTO, ONT.—Wheeler & Bain, Ltd., has been incorporated to manufacture and deal in iron, steel, metals, metal products, etc., with $100,000 capital stock, by Kenneth F. Mackenzie, 48 Castle Frank road; Murray Gordon, 71 Bay street, and others.

TORONTO, ONT.—The Sloan Valve Co., Ltd., has been incorporated with $40,000 capital to manufacture valves, plumbing specialties, etc., by Edward W. Wright, 120 Bay street; Ewart W. Wright, 120 Bay street; Ewart R. Lynch, 86 Erskine avenue, and others.

TORONTO, ONT.—The Independent Electric Lamp Co., Ltd., has been incorporated to manufacture electric lamps, electrical appliances, equipment, machinery, etc., with $40,000 capital stock, by Alfred E. Firth, 53 Strathcona avenue; Gordon C. Yake, and others.

TORONTO, ONT.—Contraflow Heaters, Ltd., has been incorporated to manufacture iron, steel heating appliances, etc., with $100,000 capital stock, by Fred H. Barlow, 32 Breadalbane avenue; F. C. L. Jones, 36 Toronto street, and others.

TORONTO, ONT.—The Taylor Rubber Co., Ltd., has been incorporated to manufacture rubber goods, etc., with $1,500,000 capital stock; by Eli J. Taylor, of Toronto; Nathan S. Wigle, Hugh Thorbrun, both of Detroit; Parker G. Bolton, of Ruthven, Ont., and others.

WALKERVILLE, ONT.—The Barco Mfg. Co., Ltd., has been incorporated to manufacture and deal in iron, steel, metal products, castings, forgings, etc., with $25,000 capital stock, by Richmond W. Hart, George M. Clark, Charles H. C. Legott, and others, all of Toronto, Ont.

WALKERVILLE, ONT.—The Nobar Mfg. Co., Ltd., has been incorporated to manufacture iron, steel, brass, and other metal products, with $25,000 capital stock, by Joseph E. Norbury, Bernard H. Furlong, Windsor, Ont., and Charles Barton, Walkerville.

Iron and Steel Production

Compiled By THE IRON TRADE REVIEW

Pig Iron

	-Stacks- No.	In	-Output- Total	Av. daily
1907				
January	376	311	2,174,801	69,509
February	374	308	2,047,036	73,109
March	377	304	2,186,709	70,539
April	378	327	2,226,708	74,223
May	391	329	2,291,030	73,904
June	392	341	2,237,420	74,580
July	396	335	2,253,243	72,685
August	397	329	2,243,656	72,376
September	399	329	2,174,148	72,471
October	401	314	2,359,690	76,119
November	398	226	1,820,558	60,685
December	398	154	1,234,733	39,830
Total			25,299,732	
1908				
January	398	139	1,081,813	34,316
February	401	150	1,086,809	37,476
March	398	154	1,229,856	39,672
April	398	146	1,155,122	38,504
May	396	145	1,168,002	37,677
June	395	154	1,106,300	36,876
July	397	166	1,228,604	39,632
August	399	181	1,366,019	44,065
September	399	189	1,416,252	47,208
October	400	200	1,573,824	50,764
November	402	212	1,582,314	52,744
December	403	221	1,723,664	55,602
Total			15,680,140	
1909				
January	406	234	1,787,473	57,683
February	407	233	1,682,470	60,088
March	406	229	1,822,024	58,793
April	406	224	1,731,406	57,687
May	407	236	1,866,757	60,218
June	408	240	1,929,929	64,334
July	409	258	2,088,620	67,375
August	412	278	2,232,642	72,021
September	413	297	2,378,655	79,186
October	413	309	2,589,681	84,001
November	414	311	2,532,740	84,425
December	416	314	2,682,702	86,539
Total			25,337,002	
1910				
January	416	311	2,599,995	83,871
February	417	311	2,429,525	86,747
March	417	310	2,588,736	83,580
April	418	291	2,477,700	82,590
May	421	206	1,871,388	60,367
June	420	271	2,288,279	76,276
July	420	254	2,158,124	69,617
August	422	244	2,103,793	67,864
September	420	234	2,048,461	68,282
October	421	230	2,086,205	67,297
November	421	218	1,910,385	63,679
December	421	193	1,779,899	57,192
Total			26,840,314	
1911				
January	421	210	1,766,658	56,985
February	421	226	1,781,285	63,617
March	421	236	2,165,764	69,867
April	421	220	2,044,904	68,163
May	421	206	1,871,388	60,367
June	421	202	1,773,282	59,109
July	423	196	1,776,108	57,294
August	423	206	1,921,832	61,995
September	423	216	1,973,918	65,797
October	421	214	2,092,061	67,486
November	421	214	1,999,100	66,637
December	422	215	2,032,301	65,558
Total			23,198,601	
1912				
January	421	227	2,052,806	66,220
February	422	235	2,098,796	72,372
March	420	237	2,411,529	77,791
April	421	239	2,377,621	79,254
May	423	243	2,503,341	80,753
June	424	242	2,433,737	81,125
July	422	245	2,402,567	77,502
August	423	255	2,500,163	80,650
September	419	262	2,444,454	81,482
October	422	280	2,683,645	86,569
November	423	289	2,639,562	87,985
December	423	291	2,777,292	89,590
Total			29,325,513	
1913				
January	423	297	2,287,800	89,929
February	423	306	2,778,670	92,095
March	423	278	2,562,823	89,123
April	421	297	2,754,353	91,812
May	421	285	2,716,825	90,865
June	422	283	2,816,883	87,229
July	422	264	2,658,275	82,525
August	424	260	2,537,018	81,839
September	425	258	2,594,098	83,137
October	425	244	2,439,924	81,933
November	424	225	2,529,960	74,322
December	424	191	1,976,138	63,746
Total			30,652,767	
1914				
January	423	199	1,879,336	60,624
February	423	219	1,888,607	67,450
March	423	232	2,341,551	75,534
April	422	212	2,261,501	75,383
May	422	198	2,097,019	67,646
June	422	193	1,904,566	63,486
July	422	187	1,955,324	63,075
August	422	187	1,996,483	64,403
September	422	180	1,882,718	62,757
October	422	162	1,767,227	57,007
November	421	150	1,501,269	50,042
December	421	154	1,495,325	48,236
Total			22,970,926	
1915				
January	421	165	1,591,024	51,323
February	421	179	1,666,592	59,521
March	421	190	2,046,280	66,009
April	421	197	2,114,516	70,484
May	421	207	2,255,157	72,747
June	421	221	2,369,932	78,998
July	421	234	2,563,311	82,687
August	421	246	2,774,825	89,510
September	420	266	2,834,342	94,478
October	420	276	3,120,340	100,656
November	421	285	3,035,235	101,174
December	421	295	3,201,605	103,278
Total			29,573,161	
1916				
January	421	304	3,171,878	102,319
February	421	312	3,078,548	106,157
March	422	315	3,327,630	107,343
April	422	320	3,225,496	107,517
May	423	321	3,364,584	108,535
June	423	325	3,213,818	107,127
July	419	316	3,221,127	103,907
August	419	317	3,197,838	103,156
September	419	326	3,208,041	106,935
October	419	328	3,508,180	113,167
November	420	322	3,317,805	110,593
December	422	309	3,184,178	102,715
Total			39,019,123	
1917				
January	422	310	3,159,839	101,930
February	422	317	2,649,935	94,641
March	423	331	3,255,813	105,026
April	425	333	3,328,061	110,936
May	425	340	3,413,677	110,119
June	427	347	3,260,234	108,675
July	429	351	3,337,442	107,659
August	431	355	3,238,970	104,483
September	431	344	3,140,742	104,691
October	433	354	3,296,286	106,332
November	434	344	3,198,597	106,620
December	435	321	2,885,380	93,077
Total			38,164,976	
1918				
January	435	294	2,403,227	77,523
February	436	319	2,318,242	82,794
March	438	338	3,209,996	103,548
April	437	351	3,273,355	109,112
May	437	360	3,451,884	111,351
June	437	353	3,316,148	110,538
July	437	364	3,408,584	109,954
August	439	371	3,378,479	108,983
September	438	364	3,413,223	113,774
October	437	364	3,482,392	112,335
November	437	360	3,347,844	111,595
December	435	351	3,434,114	110,602
Total			38,437,488	
1919				
January	435	330	3,306,279	106,654
February	435	311	2,943,347	105,270
March	435	279	3,088,023	99,614
April	435	216	2,474,374	82,479
May	433	197	2,107,729	67,991
June	433	199	2,114,028	70,467
July	434	240	2,424,212	78,200
August	432	266	2,742,081	88,453
September	433	163	2,480,790	82,692
October	432	216	1,864,424	60,142
November	432	252	2,407,369	80,244
December	432	262	2,626,074	84,711
Total			30,578,780	
1920				
January	432	285	3,012,373	97,172
February	432	305	2,984,257	102,904
March	433	315	3,375,768	108,895
April	433	278	2,752,670	91,754
May	433	297	2,991,825	96,510
June	433	302	3,046,623	101,553
July	434	291	3,043,918	98,190
August	434	306	3,145,536	101,168
September	434	317	3,124,308	104,173
October	435	290	3,288,341	106,075
November	435	255	2,935,081	97,836
December	435	202	2,700,268	87,105
Total			36,400,968	
1921				
January	436	184	2,414,753	77,895
February	436	155	1,927,088	68,906
March	436	103	1,593,542	51,447
April	436	96	1,190,751	39,691
May	436	90	1,215,272	39,202
June	436	74	1,064,007	35,466
July	435	69	864,580	27,890
Total			10,273,623	

Lake Ore Shipments

Gross Tons

1920	60,411,572
1919	48,546,651
1918	62,836,172
1917	64,437,003
1916	66,658,466
1915	47,272,751
1914	32,729,726
1913	49,947,116
1912	48,221,546
1911	32,793,130
1910	43,435,171
1909	42,586,869
1908	26,014,987
1907	42,266,668

By Months, 1921

April	176,211
May	2,594,027
June	3,600,989
July	4,047,687
Total	10,418,914

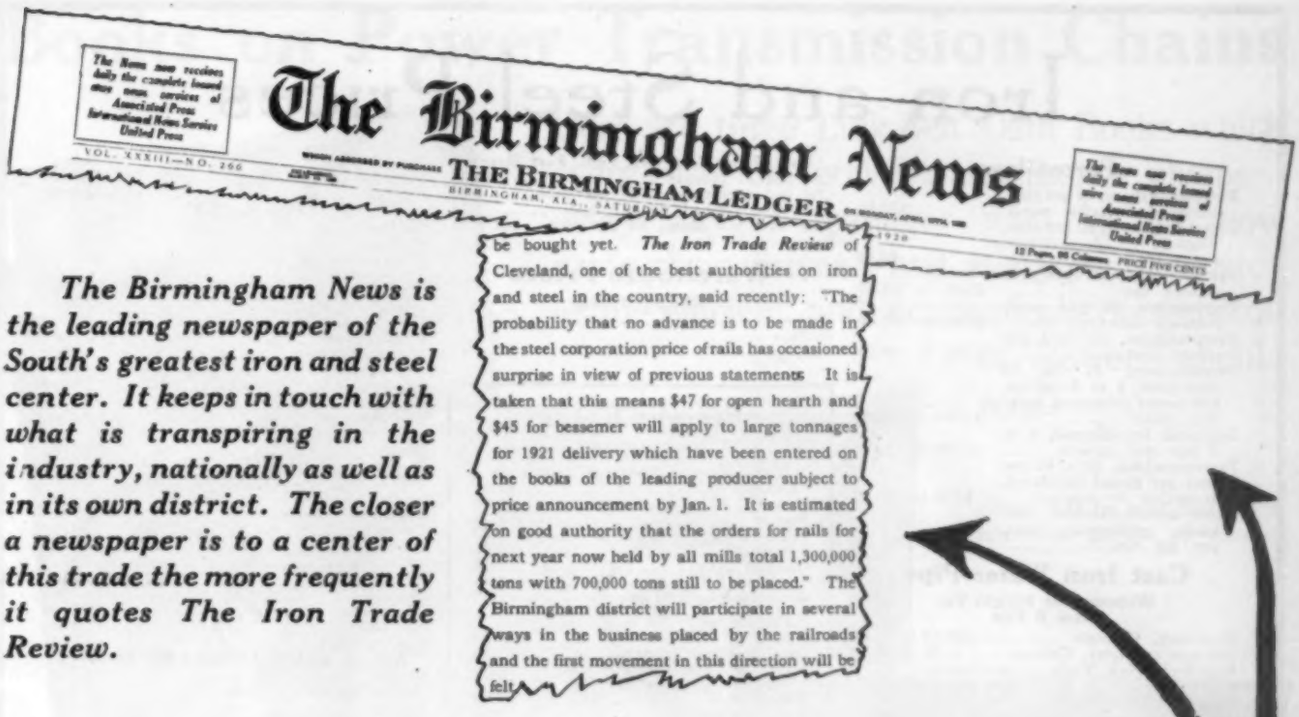
Ingots and Castings

By American Iron & Steel Institute

	Ingots	Castings	Total
1910	25,154,087	940,832	26,094,919
1911	23,029,479	646,627	23,676,106
1912	30,284,682	966,621	31,251,303
1913	30,280,130	1,020,744	31,300,874
1914	22,819,784	693,246	23,513,030
1915	31,284,212	866,824	32,151,036
1916	41,401,917	1,371,763	42,773,680
1917	43,619,200	1,441,407	45,060,607
1918	43,051,022	1,411,410	44,462,432
1919	33,694,795	976,437	34,671,232
1920	40,881,392	1,251,542	42,132,934

Monthly Ingot Output

	Gross Tons 84.21 per cent of capacity	Indicated total
January	2,203,186	2,620,000
February	1,749,477	2,080,000
March	1,570,978	1,860,000
April	1,213,958	1,440,000
May	1,265,850	1,500,000
June	1,003,406	1,190,000
July	803,376	955,000
Total	9,810,231	11,645,000


The Birmingham News

THE BIRMINGHAM LEDGER

be bought yet. *The Iron Trade Review* of Cleveland, one of the best authorities on iron and steel in the country, said recently: "The probability that no advance is to be made in the steel corporation price of rails has occasioned surprise in view of previous statements. It is taken that this means $47 for open hearth and $45 for bessemer will apply to large tonnages for 1921 delivery which have been entered on the books of the leading producer subject to price announcement by Jan. 1. It is estimated on good authority that the orders for rails for next year now held by all mills total 1,300,000 tons with 700,000 tons still to be placed." The Birmingham district will participate in several ways in the business placed by the railroads and the first movement in this direction will be felt

The Birmingham News is the leading newspaper of the South's greatest iron and steel center. It keeps in touch with what is transpiring in the industry, nationally as well as in its own district. The closer a newspaper is to a center of this trade the more frequently it quotes The Iron Trade Review.

400 Newspapers Regularly Quote

THE IRON TRADE REVIEW

CLEVELAND

The international reputation and the World-wide circulation of THE IRON TRADE REVIEW is the result of year after year of unfailing Editorial accuracy and reliability.

PROOF—

THE IRON TRADE REVIEW

"The Most Widely Quoted Trade Paper In The World"

Iron and Steel Prices

Ferroalloys

Ferromanganese, 80 per cent, delivered, domestic metal	$70.00
Ferromanganese, 80 per cent, English, c.i.f. Atlantic port	65.00
Spiegel, 18 to 22 per cent furnace spot	25.00 to 26.00
Ferrosilicon, 50 per cent, contract delivered	60.00 to 65.00
Ferrotungsten, standard, per pound contained	36.50 to 40.00
Ferrochrome, 60 to 70 chromium, 6 to 8 carbon, per pound contained, maker's plant	14.00c to 15.00c
Imported ferrochrome, 6 to 8 per cent carbon	12.00c to 12.50c
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	$4.50 to $5.00
Ferro carbon-titanium, carloads, producers plant, per net ton	$200.00

Cast Iron Water Pipe

Without War Freight Tax
Class B Pipe

Four-inch, Chicago	$46.60 to 49.10
Six-inch and over, Chicago	42.60 to 49.10
Four-inch, New York	48.30
Six-inch and over, New York	43.30
Four-inch, Birmingham	40.00
Six-inch and over, Birmingham	38.00
Three-inch, Birmingham	50.00

Class A pipe is $3 higher than Class B. Standard fittings, Birmingham, base, $100.00 6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Rivets

Structural rivets	2.35c to 2.40c
Boiler rivets, Pittsburgh	2.45c to 2.50c
Rivets ½-in. and smaller, Pittsburgh	65-10-10 to 65-10-10-5 off

Nuts and Bolts

NUTS

(Up to 1¼ and 1½ inches inclusive)

Hot pressed, square blank	$4.60 off
Hot pressed, square tapped	4.25 off
Hot pressed, hexagon blank	4.60 off
Hot pressed, hexagon tapped	4.25 off
Cold pressed, square tapped	4.25 off
Cold pressed, square blank	4.60 off
Cold pressed, hexagon tapped	4.25 off
Cold pressed, hexagon blank	4.60 off
Cold pressed semifinished hexagon nuts ⅝ in. and larger	70-10-10 off
Cold pressed semifinished hexagon nuts 9/16 in. and smaller	80-10-10 off

Price f.o.b. Pittsburgh, Packages of 50.

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter)

Rolled thread	65-10 off
Cut thread	60-10 off
Larger and longer	60-10 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts)

Rolled thread	70-7½ off
Cut thread 6	65-10 off
Larger and longer	65-10 off

(⅜ x 4 inches, cold punched nuts)

Cut thread	60-5 off
Larger and longer	60 off
Lag screws	70 off
Plow bolts Nos. 1, 2 and 3 heads	60-10 off

Manganese Ore

Brazilian, 48 to 50 per cent c.i.f. Atlantic ports, nominal.

Indian 48 to 50 per cent c.i.f. Atlantic ports, 22½ to 24 cents per unit, nominal.

Fluor Spar

Washed gravel Kentucky and Illinois mines, per ton $17.00

Iron Ore

Superior Ores, Per Ton, Lower Lake Ports

Old range Bessemer, 55 per cent iron	$6.45
Mesabi Bessemer, 55 per cent iron	6.20
Old Range nonbessemer, 51½ per cent iron	5.70
Mesabi nonbessemer, 51½ per cent iron	5.55

Port Henry Iron Ore, f.o.b. Port Henry

Old bed 21 furnace	$4.85
Old bed concentrates, 63 per cent	5.75
Harmony, cobbed, 63 per cent	5.75
New bed, low phos., 65 per cent	8.50
Lump ore for fix	6.00

Warehouse Prices

STEEL BARS

Boston	2.815c
Buffalo	2.80c
Chicago	2.78c
Cincinnati	3.225c
Cleveland	2.64c
Detroit	2.83c
New York	2.78c
Philadelphia	2.75c
San Francisco	4.15c
Seattle	4.00c
St. Louis	2.875c
St. Paul	3.21c
Los Angeles	2.75c

IRON BARS

Boston	2.83c
Buffalo	2.80c
Chicago	2.78c
Cincinnati	3.15c
Detroit	2.83c
New York	2.78c
Philadelphia	2.75c
St. Louis	2.875c

SHAPES

Boston	2.915c
Buffalo	2.90c
Chicago	2.88c
Cincinnati	3.25c
Cleveland	2.74c
Detroit	2.93c
New York	2.88c
Philadelphia	2.85c
San Francisco	4.25c
Seattle	4.00c
St. Louis	2.975c
St. Paul	3.31c
Los Angeles	2.85c

PLATES

Boston	2.915c
Buffalo	2.90c
Chicago	2.88c
Cincinnati	3.25c
Cleveland	2.74c
Detroit	2.93c
New York	2.88c
Philadelphia	2.85c
San Francisco	4.25c
Seattle	4.10c
St. Louis	2.975c
St. Paul	3.31c
Los Angeles	4.25c

NO. 10 BLUE ANNEALED SHEETS

Boston	3.73c
Buffalo	3.45c
Chicago	3.53c
Cincinnati	3.90c
Cleveland	3.25c to 3.50c
Detroit	3.48c
New York	3.53c
Philadelphia	3.50c
San Francisco	5.50c
Seattle	5.25c
St. Louis	3.625c
St. Paul	3.96c
Los Angeles	5.50c

NO. 28 BLACK SHEETS

Boston	4.75c
Buffalo	4.30c
Chicago	4.65c
Cincinnati	3.15c
Cleveland	4.00c to 4.50c
Detroit	4.58c
New York	4.25c
Philadelphia	4.00c
San Francisco	6.50c
Seattle	6.25c
St. Louis	4.75c
St. Paul	5.18c
Los Angeles	6.50c

NO. 28 GALVANIZED SHEETS

Boston	5.75c
Buffalo	5.30c
Chicago	5.65c
Cincinnati	4.50c
Cleveland	5.00c to 5.50c
Detroit	5.58c
New York	5.25c
Philadelphia	5.00c
San Francisco	7.50c
Seattle	7.25c
St. Louis	5.65c
Los Angeles	7.50c

BANDS

Boston	3.465c
Buffalo	3.50c
Chicago	3.48c
Cincinnati	3.85c
Detroit	3.48c
New York	3.43c
Philadelphia	3.40c
San Francisco	4.85c
Seattle	4.65c
Los Angeles	4.00c

HOOPS

Boston	4.18c
Buffalo	3.50c
Detroit	3.48c
New York	3.88c
Philadelphia	3.65c

COLD ROLLED SHAFTING

Boston	4.05c
Buffalo	4.20c
Chicago	4.20c to 4.70c
Cincinnati	4.40c
Detroit	4.30c
New York	4.23c
New York (flats, squares and hexagons)	4.73c
Philadelphia	4.20c
San Francisco	5.85c
Seattle	5.55c
Los Angeles	5.85c

Freight Rates

PIG IRON

Mahoning and Shenango valleys to:

Cleveland	$1.96
Newark, N. J.	6.72
Boston	7.28
Philadelphia	6.32
Pittsburgh	1.96
Chicago	5.32
St. Louis	6.44
Minneapolis, St. Paul	7.60

Buffalo to:

Albany, N. Y.	$2.52
New England (rail)	5.46
New York and Brooklyn (rail)	5.46

Virginia furnaces to:

Philadelphia	$5.74
New England	6.58
Brooklyn, Jersey City, Newark	6.16

Birmingham, Ala., to:

Boston	$10.665
Boston (rail and water)	7.65
Cincinnati	4.50
Chicago	6.66
Cleveland	6.66
Louisville, Ky.	4.12
Minneapolis, St. Paul	9.73
New York	10.265
Philadelphia	8.665
Pittsburgh	7.60
Savannah, Ga.	4.25
St. Louis	5.725

Chicago to:

Des Moines	$4.725
Minneapolis, St. Paul	3.375
Milwaukee	0.89
Moline, Ill.	1.89
Omaha	6.07
St. Louis	2.725

Ironton and Jackson, O., to:

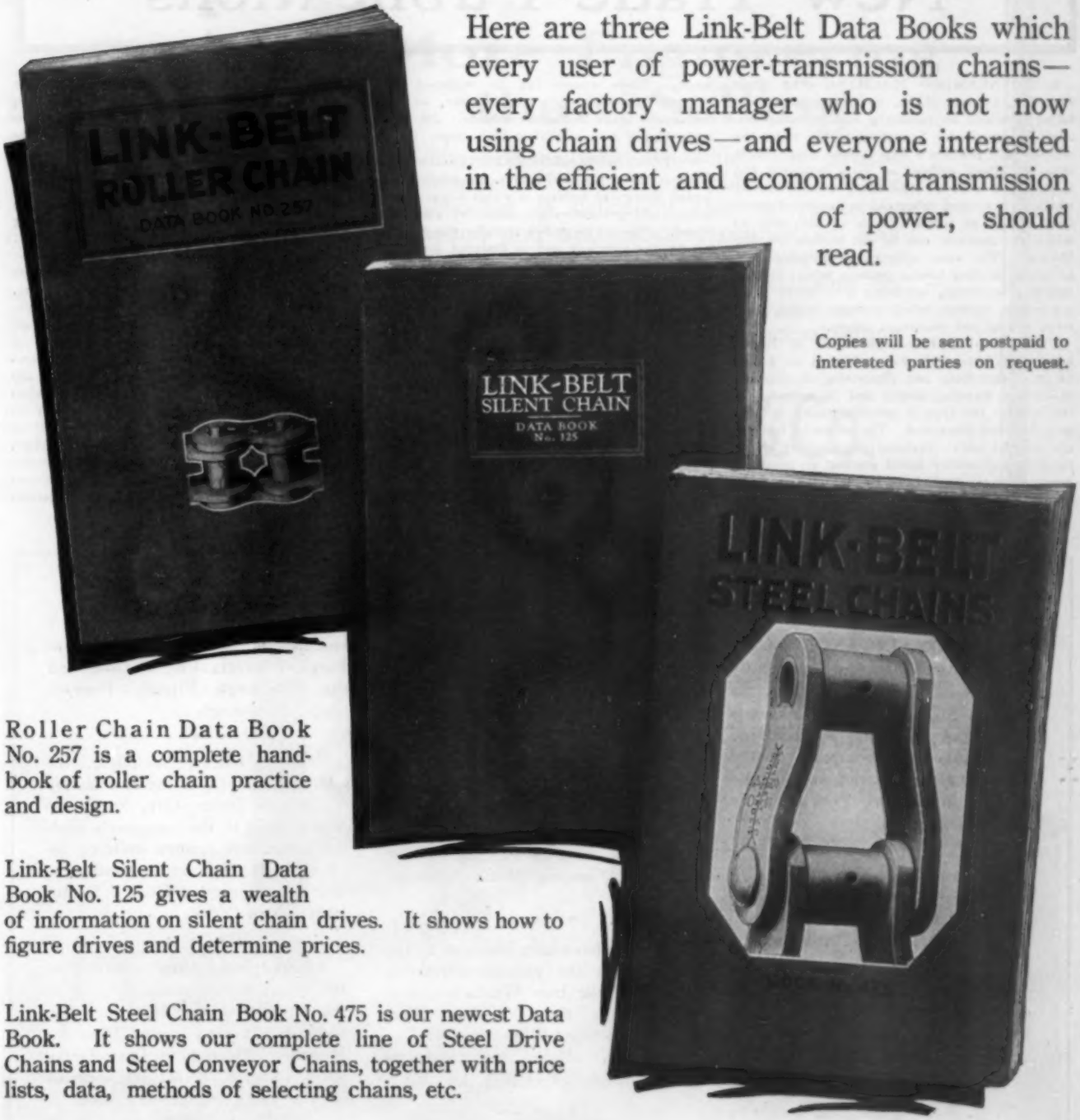
Chicago	$5.32
Cincinnati	2.52
Cleveland	3.36
Detroit	3.64
Indianapolis	3.22
Minneapolis, St. Paul	8.40

FINISHED MATERIAL

Pittsburgh, carloads, per 100 lbs., to:

New York	$0.38
Philadelphia	0.35
Boston	0.415
Buffalo	0.295
Baltimore	0.335
Cleveland	0.24
Cincinnati	0.32
Chicago	0.38
Detroit	0.32
Minneapolis and St. Paul	0.66
Denver	1.32
St. Louis	0.475
New Orleans	0.515
Birmingham	0.765
Pacific coast (all rail)	1.665
Pacific coast (tin plate)	1.665

Books on Power Transmission Chains



Here are three Link-Belt Data Books which every user of power-transmission chains—every factory manager who is not now using chain drives—and everyone interested in the efficient and economical transmission of power, should read.

Copies will be sent postpaid to interested parties on request.

Roller Chain Data Book No. 257 is a complete handbook of roller chain practice and design.

Link-Belt Silent Chain Data Book No. 125 gives a wealth of information on silent chain drives. It shows how to figure drives and determine prices.

Link-Belt Steel Chain Book No. 475 is our newest Data Book. It shows our complete line of Steel Drive Chains and Steel Conveyor Chains, together with price lists, data, methods of selecting chains, etc.

LINK-BELT COMPANY PHILADELPHIA, CHICAGO, INDIANAPOLIS
910 S. MICHIGAN AVE., CHICAGO, ILL.

_____ 1921.

Please send me copies of the books checked:

☐ Silent Chain Data Book No. 125 ☐ Roller Chain Data Book No. 257 ☐ Steel Chain Data Book No. 475

*Name*_____ *Firm*_____

*Address*_____ *Town and State*_____

780

New Trade Publications

LOCK SEAMING MACHINE—The Stolp Co., Inc., Geneva, N. Y., is circulating a small folder in which an automatic lock seaming machine is described. According to the folder the machine will produce a lock seamed article direct from the blank without an extra operation and is equipped with a self-feeding attachment by which lock seamed tubes can be produced direct from a coil of metal. Some of the uses to which the machine can be put include the following: Tin cans and metal containers of all kinds; mailing tubes; speaking tubes; blower, exhaust, ventilator, conductor and sewer pipe; automobile muffler tubes, radiator tubes, bedstead tubing and numerous others.

CRANES—The Pittsburgh Crane & Equipment Co., Pittsburgh, has published an 8-page bulletin, describing and illustrating electric and handpower traveling cranes and jib cranes. In the bulletin the type H electric trolley is fully described and illustrated. The following features are pointed out: Inclosed gears, short shafts for hoist and trolley travel gearing, no overhung gears, bronze bushed bearings, hoist gearing from motor to drum in one cast frame and the trolley traveling gearing, pyramid type, in one frame. These cranes can be equipped with dynamic braking and solenoid brake, or with mechanical brake and solenoid brake. All hoists are equipped with automatic limit stops.

MOTORS AND GENERATORS—The Allis-Chalmers Mfg. Co., Milwaukee, has published an 8-page illustrated bulletin in which direct current motors and generators are described and illustrated. The line described recently was brought out by the company and is designed for belted as well as direct applications. It is said to be particularly suited to the exacting requirements of machine tool service. Among some of the important features as pointed out in the bulletin are: Ratings and speeds corresponding to standard 60-cycle induction motors; a complete line of constant and adjustable speed ratings; cast steel yokes; dust-proof bearings; windings treated to resist oil and moisture; conduit terminal boxes on all motors; improved box type brush holders and interchangeability of parts.

ELECTRIC TRAMRAIL.—Some of the outstanding features of an electric tramrail conveying system are given in a large loose-leaf illustrated booklet being circulated by the Cleveland electric tramrail division of the Cleveland Crane & Engineering Co., Wickliffe, O. Actual installations of the system in shops and factories, including foundries, warehouses, rubber plants, coal handling plants, garages, paint shops, etc., are described and illustrated in detail. According to the booklet, this system is extremely flexible, and solves the shop conveying problems in the handling of all materials up to two tons in weight. The system reaches into every corner of the plant, passes from room to room, from building to building, around posts, through doors, up inclines as much as 12½ degrees, slopes and from floor to floor, the latter by the use of elevators. Briefly the system consists of a combination of standardized rail, fittings and carriers, which have been developed to meet the demands for an inexpensive system of shop transportation. The system is described in detail and in addition part of the booklet is devoted to describing and illustrating carriers, both hand and electric; cranes and transfer bridges; attachments; and fittings. Suggestions for applications of the system and directions for installing are given.

Industrial Business Changes Recently Announced

DISCONTINUANCE of its Boston office recently was announced by the Eastern Steel Co., but it is understood Harry O. Russ will continue to represent the company in the New England district with headquarters in the New York office, 50 East Forty-second street.

* * *

The name of the Kendall Hardware Co., 421 Main street, Cambridge, Mass., has been changed to the Kendall Nail & Hardware Co.

* * *

Offices of the Sessions Engineering Co. are now located at 832 Marquette building, 140 South Dearborn street, Chicago.

* * *

T. J. Rafferty & Co., iron and steel scrap, Worcester, Mass., have removed their offices from the Park building to their warehouse at 21-23 Ellsworth street.

* * *

Formerly located in the Whitehall building, New York, the Barrett Co. recently moved into a new office building at 40 Rector street, where it occupies three floors.

* * *

A warehouse and office has been established at 537 West Thirty-fifth street, New York, by the Consolidated Expanded Metal Co., Braddock, Pa., with Thomas R. Herbert Jr., in charge.

* * *

Word has been received to the effect the interests of the Wheeling Stove & Range Co., Wheeling, W. Va., have been taken over by the Wheeling Metal Specialty Co.

* * *

Advices have been received to the effect that the general offices of the La Belle Iron Works are now located in the Wheeling Steel Corp. building, Wheeling, W. Va., possession of the new quarters having taken effect Aug. 15.

* * *

The specialty division of the Ohio Body & Blower Co., Cleveland, has opened a Southeastern office in Atlanta, Ga., at 747 Highland avenue, with Yeatman Anderson in charge. The company specializes in the manufacture of portable steel garages.

* * *

O. J. Abell & Co., 29 South La Salle street, Chicago, has added to its lines in the machinery and machine products field, representation of the Jefferson Forge Products Co., Detroit, and the Pittsburgh Electric Furnace Corp., Pittsburgh.

* * *

General offices, including the sales department, of the Everlasting Valve Co., Jersey City, N. J., are now located in the company's modern office and factory building located at 49 Fisk street, having recently been moved from 2 Rector street, New York.

* * *

Advices have been received to the effect the Cincinnati office of the Cutler-Hammer Mfg. Co., Milwaukee, has been moved from the Dwynne building to the Dixie Terminal building. A. R. Maujer, formerly of the sales engineering force of the Pittsburgh office, is now in charge in the Cincinnati district.

* * *

Southern district offices have been opened in Birmingham, Ala., by the Refinite Co., Omaha, Nebr., manufacturer of water softeners. The territory covered by this new office comprises Alabama, Georgia, Virginia, North and South Carolina, Florida, Mississippi, Kentucky, Tennessee, Louisiana and Arkansas. W. W. Tinsley is district manager in charge.

M·A HANNA & Co.

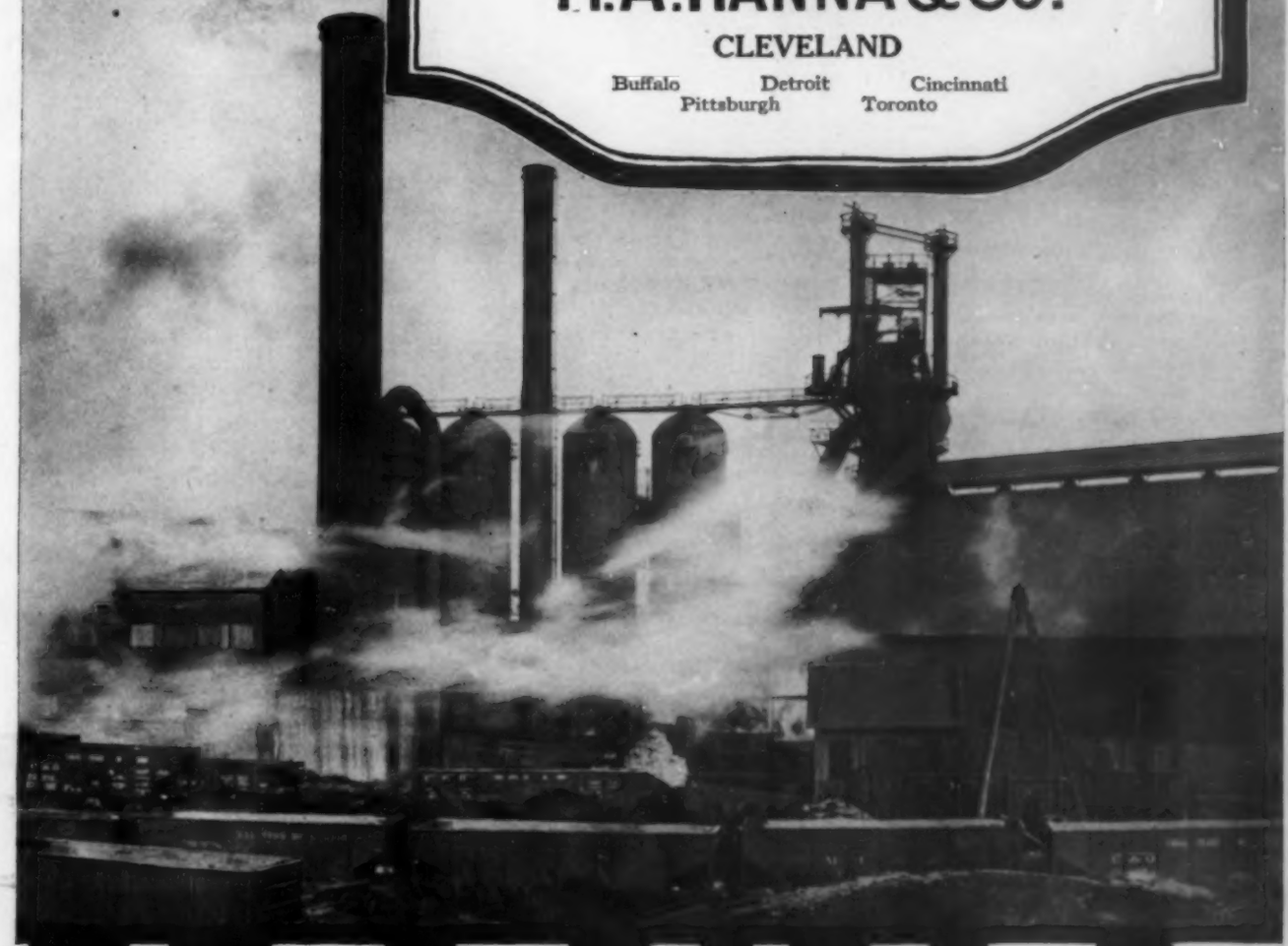
More Engineering than Selling

The responsibility for which the outside representatives of M. A. Hanna & Co. are schooled is definitely that of rendering sound and authoritative counsel on any matter pertaining to iron ore, pig iron or coal—each representative specializing on a single commodity. So long as this service is consistently maintained, the actual selling entails no great obstacles.

M. A. HANNA & CO.

CLEVELAND

Buffalo Detroit Cincinnati
Pittsburgh Toronto



HANNA

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	$11.00 to 12.00
Boston (dealers)	6.00 to 6.50
Buffalo	10.00 to 11.00
Chicago	11.00 to 11.50
Cincinnati	9.00 to 9.50
Cleveland	12.25 to 12.50
Detroit (dealers)	7.50 to 8.00
Eastern Pennsylvania	11.50 to 12.00
New York (dealers)	7.00 to 7.50
Pittsburgh	13.00 to 13.50
San Francisco	9.00 to 10.00
St. Louis	11.00 to 11.50
Valleys	13.50 to 14.00

BUNDLED SHEETS

Buffalo	$6.00 to 7.00
Cleveland (hydraulic)	8.25 to 8.50
Cincinnati	5.00 to 6.00
Eastern Pennsylvania	8.00 to 8.50
Pittsburgh	8.50 to 9.00
St. Louis	4.00 to 4.50

STEEL RAILS, SHORT

Birmingham	$11.50 to 12.50
Boston (dealers)	7.00 to 8.00
Chicago	12.50 to 13.00
Cincinnati	11.50 to 12.50
Cleveland	9.75 to 10.25
St. Louis	11.50 to 12.00

STOVE PLATE

Birmingham	$12.50 to 13.50
Boston	10.50 to 11.00
Buffalo	11.00 to 12.00
Chicago	13.50 to 14.00
Cincinnati	10.00 to 10.50
Cleveland	12.75 to 13.00
Detroit	10.00 to 11.00
Eastern Pennsylvania	12.00 to 12.50
New York	8.50 to 9.00
Pittsburgh	12.00 to 13.00
St. Louis	11.50 to 12.00

LOW PHOSPHORUS

Buffalo	$14.50 to 15.50
Cincinnati	16.00 to 17.00
Eastern Pennsylvania	16.00 to 17.00
...s. billet and bloom crops	16.00 to 17.00

SHOVELING STEEL

Chicago	$10.50 to 11.00
Pittsburgh	9.00 to 9.50
St. Louis	10.00 to 10.50

KNUCKLES, COUPLERS & SPRINGS

Chicago	$13.50 to 14.00
Eastern Pennsylvania	15.00 to 16.00
Pittsburgh	14.00 to 14.50
St. Louis	12.00 to 12.50

COMPRESSED SHEETS

Buffalo	$9.00 to 9.50
Chicago	7.50 to 8.00
Pittsburgh	10.50 to 11.00

FROGS, SWITCHES, GUARDS

Chicago	$11.00 to 11.50
Eastern Pennsylvania	11.00 to 11.50
St. Louis	12.00 to 12.50

BOILER PLATE, CUT

Detroit (dealers)	$6.00 to 6.50
St. Louis	6.00 to 6.50

ANGLE BARS—STEEL

Chicago	$12.50 to 13.00
St. Louis	10.00 to 10.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham, No. 1	$11.50 to 12.50
Boston (dealers)	11.00 to 12.00
Buffalo	13.00 to 14.00
Chicago, No. 1	12.50 to 13.00
Chicago, No. 2	11.25 to 11.75
Cincinnati No. 1	8.50 to 9.50
Cleveland, No. 1	12.00 to 12.25
Eastern Pennsylvania, No. 1	14.00 to 15.00
New York, No. 1 (dealers)	11.00 to 11.50
Pittsburgh, No. 1	10.00 to 11.00
Pittsburgh, No. 2	13.00 to 13.50
St. Louis, No. 1	12.50 to 13.00
St. Louis, No. 2	11.75 to 12.25

WROUGHT PIPE

Boston (dealers)	$7.00 to 8.00
Buffalo	9.50 to 10.50
Eastern Pennsylvania	13.00 to 13.50
New York (dealers)	8.00 to 8.50

YARD WROUGHT

Boston	$8.00 to 9.00
Eastern Pennsylvania, No. 1	12.00 to 13.00

CITY WROUGHT

New York, long	$9.00 to 9.50

BUSHELING

Buffalo, No. 1	$9.00 to 10.00
Chicago, No. 1	11.50 to 12.00
Chicago, No. 2	6.50 to 7.50
Cincinnati, No. 1	8.50 to 9.50
Cleveland, No. 1	8.00 to 8.50
Cleveland, No. 2	5.00 to 6.00
Eastern Pennsylvania, No. 1	12.50 to 13.00
Pittsburgh	11.50 to 12.00
St. Louis, No. 1	12.00 to 12.50

MACHINE SHOP TURNINGS

Birmingham	$5.00 to 6.00
Boston (dealers)	2.00 to 2.50
Buffalo	4.00 to 5.00
Chicago	4.00 to 5.00
Cincinnati	2.00 to 2.50
Cleveland	6.25 to 6.75
Detroit (dealers)	2.00
Eastern Pennsylvania	8.00 to 8.50
New York (dealers)	3.00 to 3.50
Pittsburgh	8.00 to 8.50
St Louis	5.00 to 5.50
Valleys	8.50 to 8.75

CAST IRON BORINGS

Birmingham	$5.00 to 6.00
Boston (chemical)	3.50 to 4.00
Boston (dealers)	2.50 to 3.00
Buffalo	4.00 to 5.00
Chicago	5.75 to 6.25
Cincinnati	2.00 to 2.50
Cleveland	8.00 to 8.50
Detroit (dealers)	3.00
Eastern Pennsylvania	10.00 to 10.50
Eastern Pennsylvania (chem.)	10.00 to 11.00
New York (dealers' price)	4.00 to 4.50
Pittsburgh	8.50 to 9.00
St. Louis	7.00 to 7.50
Valleys	10.00 to 10.50

MIXED BORINGS AND TURNINGS

(For blast furnace use)

Boston (dealers)	$2.00 to 2.50
Cleveland	8.00 to 8.50
Eastern Pennsylvania	7.50 to 8.00

IRON AXLES

Birmingham	$18.00 to 20.00
Buffalo	26.00
Chicago	18.50 to 19.00
Cincinnati	17.00 to 17.50
Cleveland	18.00 to 19.00
Detroit	23.00 to 24.00
Eastern Pennsylvania	25.00 to 26.00
New York (dealers)	18.00 to 19.00
Pittsburgh	18.00 to 19.00
St. Louis	17.00 to 17.50

IRON RAILS

Buffalo	$21.00 to 22.00
Chicago	15.00 to 15.50
Cincinnati	13.00 to 14.00
Cleveland	12.00 to 13.00

PIPES AND FLUES

Chicago	$8.00 to 8.50
Cincinnati	5.00 to 5.50
Cleveland	7.00 to 8.00
Detroit	6.00
St. Louis	7.50 to 8.00

RAILROAD GRATE BARS

Buffalo	$8.00 to 9.00
Chicago	11.50 to 12.00
Cleveland	12.50 to 13.00
Detroit	8.00 to 9.00
Eastern Pennsylvania	13.00 to 13.50
New York (dealers)	9.00 to 9.50
St. Louis	9.00 to 9.50

FORGE FLASHINGS

Boston (dealers)	$4.50 to 5.00
Chicago, small	7.00 to 7.50
Cleveland, small	7.50 to 8.00
Cleveland, large	6.50 to 7.00
Detroit (dealers)	4.00

FORGE SCRAP

Boston	$4.50 to 5.00
Chicago	11.25 to 11.75
Eastern Pennsylvania, No. 1	10.00 to 10.50

ARCH BARS AND TRANSOMS

Chicago	$17.25 to 17.75
St. Louis	16.00 to 16.50

ANGLE BARS—IRON

Chicago	$15.50 to 16.00
St. Louis	10.50 to 11.00

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	$3.50 to 4.00
Buffalo	8.00 to 9.00
Chicago	8.00 to 8.50
Cleveland	9.50 to 10.00
Detroit	6.00 to 7.00
Eastern Pennsylvania	9.50 to 10.00
Pittsburgh	9.50 to 10.00
St. Louis	6.00 to 6.50

STEEL CAR AXLES

Birmingham	$14.00 to 16.00
Boston (dealers)	12.00 to 13.00
Buffalo	20.00 to 21.00
Chicago	15.25 to 15.75
Cleveland	17.00 to 17.50
Eastern Pennsylvania	17.00 to 18.00
New York (dealers)	11.50 to 12.00
Pittsburgh	14.00 to 14.50
St. Louis	13.50 to 14.00

SHAFTING

Boston (dealers)	$12.00 to 13.00
Chicago	19.50 to 20.50
Eastern Pennsylvania	19.00 to 20.00
New York (dealers)	12.00 to 13.00
Pittsburgh	13.00 to 14.00
St. Louis	13.00 to 13.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	$12.00 to 13.00
Birmingham, tram car	11.00 to 12.00
Boston (consumers)	17.50 to 18.00
Buffalo, iron	13.00 to 14.00
Chicago, iron	14.50 to 15.00
Cincinnati	11.00 to 12.00
Cleveland, iron	13.00 to 13.50
Detroit	12.00
Eastern Pennsylvania, iron	16.00 to 17.00
New York, iron	13.00 to 13.50
Pittsburgh, iron	14.00 to 14.50
Pittsburgh, steel	13.50 to 14.00
St. Louis, iron	12.00 to 12.50

NO. 1 CAST SCRAP

Birmingham cupola	$16.00 to 17.00
Boston (consumers)	16.50 to 17.00
Buffalo	14.00 to 15.00
Chicago, cupola	14.50 to 15.00
Cincinnati, No. 1, machinery, cupola (net)	11.00 to 12.00
Cleveland, cupola	16.00 to 16.50
Eastern Pennsylvania, cupola	16.50 to 17.50
New York cupola (dealers)	13.50 to 14.00
Pittsburgh, cupola	15.50 to 16.00
San Francisco	20.00 to 21.00
St. Louis, agricultural	12.00 to 12.50
St. Louis, railroad	13.50 to 14.00
Valleys	18.00 to 19.00

HEAVY CAST

Boston (consumers)	$14.00 to 15.00
Buffalo	16.00 to 16.50
Cleveland	11.25 to 11.75
New York (dealers)	13.00 to 13.50
Pittsburgh	14.50 to 15.00

MALLEABLE

Boston, railroad	$14.50 to 15.00
Buffalo	11.50 to 12.50
Chicago, railroad	14.50 to 15.00
Chicago, agricultural	14.50 to 15.00
Cincinnati, agricultural	8.50 to 9.00
Cincinnati, railroad	8.50 to 9.00
Cleveland, agricultural	9.50 to 10.25
Cleveland, railroad	12.50 to 13.00
Detroit	9.00 to 9.50
Eastern Pennsylvania, railroad	15.00 to 16.00
Pittsburgh, railroad	12.00 to 13.00
Pittsburgh, agricultural	9.00 to 10.00
St. Louis, agricultural	9.50 to 10.00
St. Louis, railroad	9.50 to 10.00

Miscellaneous Scrap

REROLLING RAILS

5 feet and over

Birmingham	$12.00 to 13.00
Boston (dealers)	8.00 to 9.00
Chicago	13.50 to 14.00
Cleveland	14.25 to 15.00
Detroit (dealers)	9.00
Eastern Pennsylvania	15.00 to 16.00
New York (dealers)	13.50 to 14.50
Pittsburgh district	15.00 to 16.00
St. Louis	12.00 to 12.50

LOCOMOTIVE TIRES

Chicago	$12.00 to 12.50
St. Louis	9.50 to 10.00

LOW PHOSPHORUS PUNCHINGS

Chicago	$13.00 to 13.50
Eastern Pennsylvania	15.00 to 16.00
Pittsburgh	13.50 to 14.00